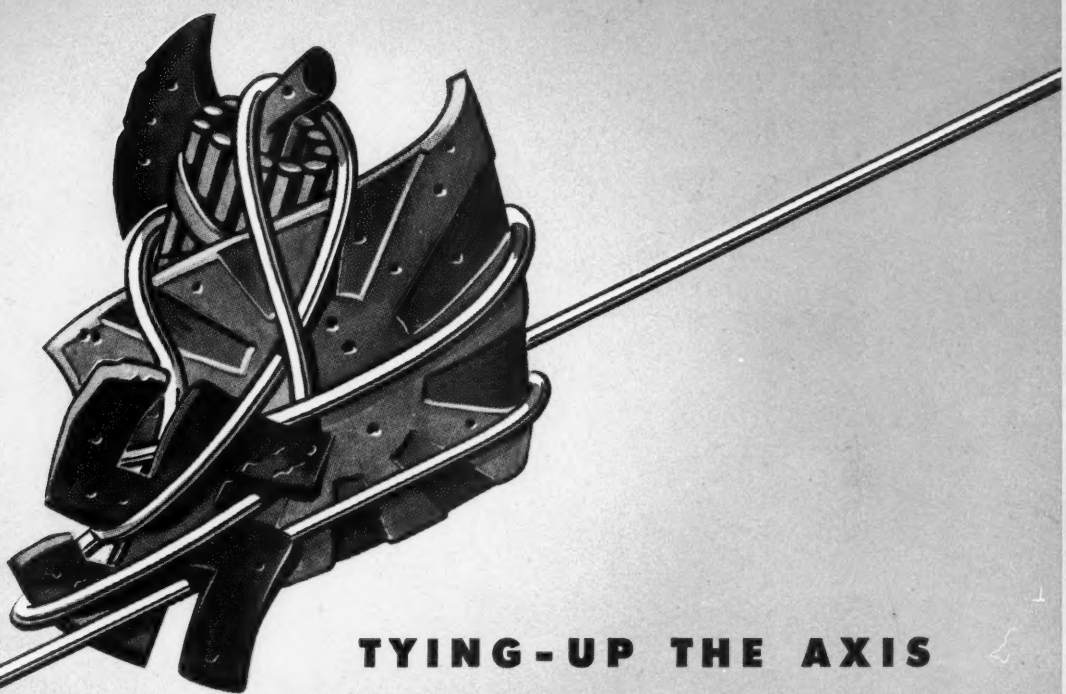
WIRE AND WIRE PRODUCTS

SEPTEMBER 1943



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Relentless as a strangler's noose, Allied wire is choking the life of the Axis—wire in a thousand forms, on every front, behind every line. More and ever more wire—in quantities unmatched and undreamed of by the enemy—*produced in large part by dependable Vaughn Machinery.*

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OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

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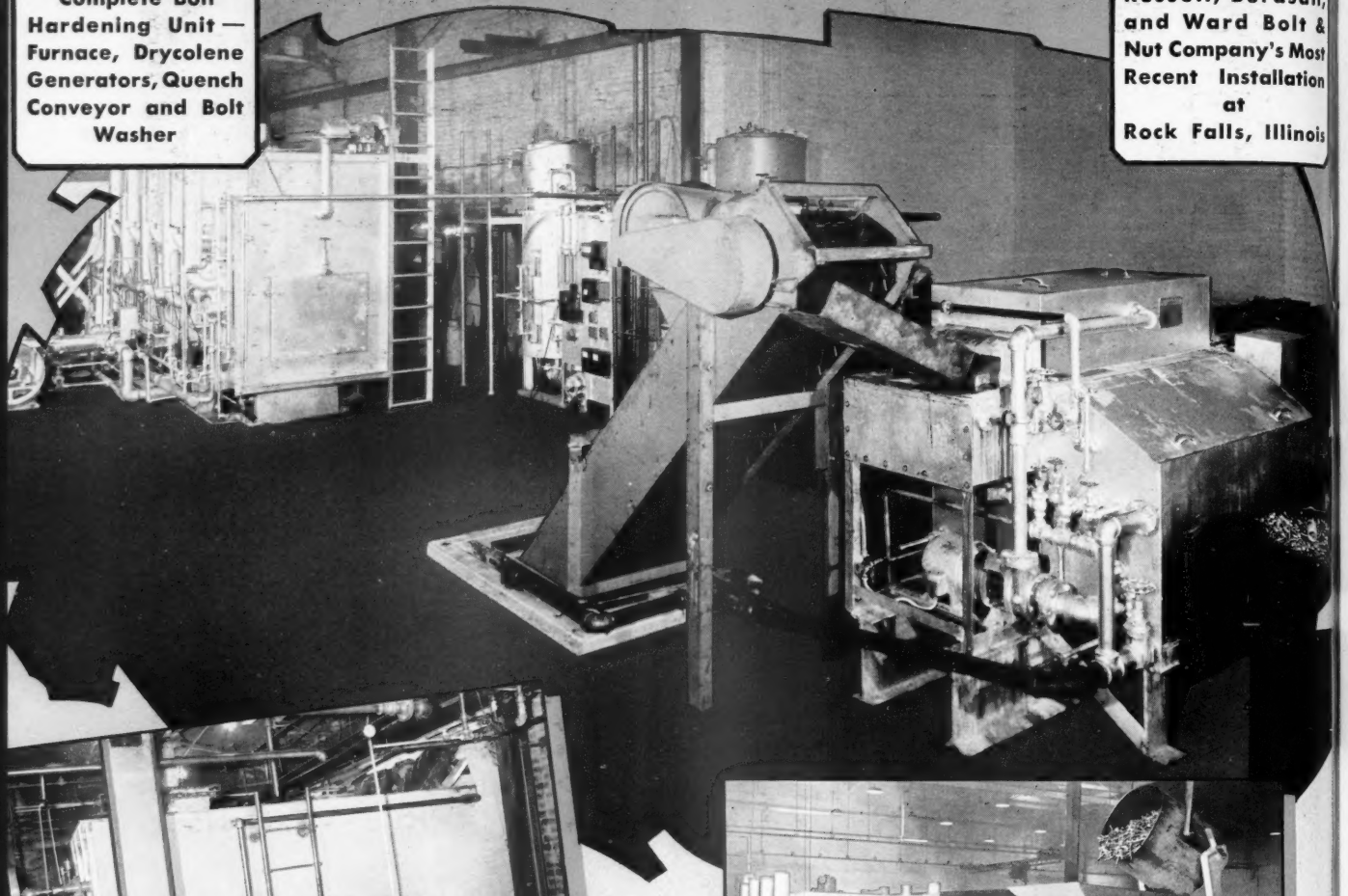

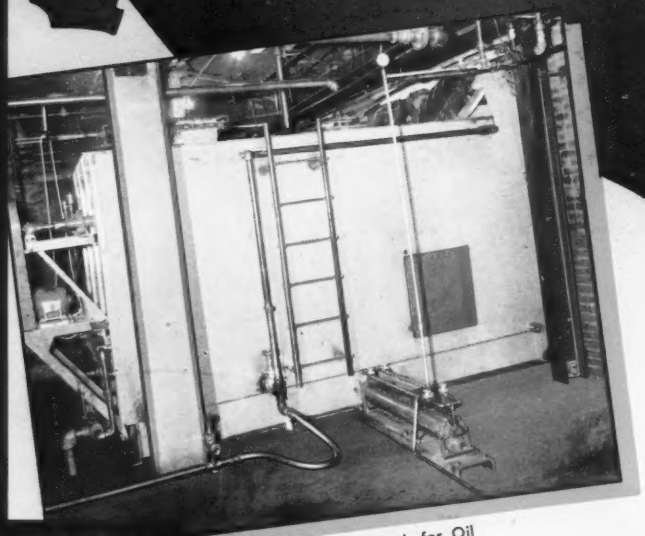

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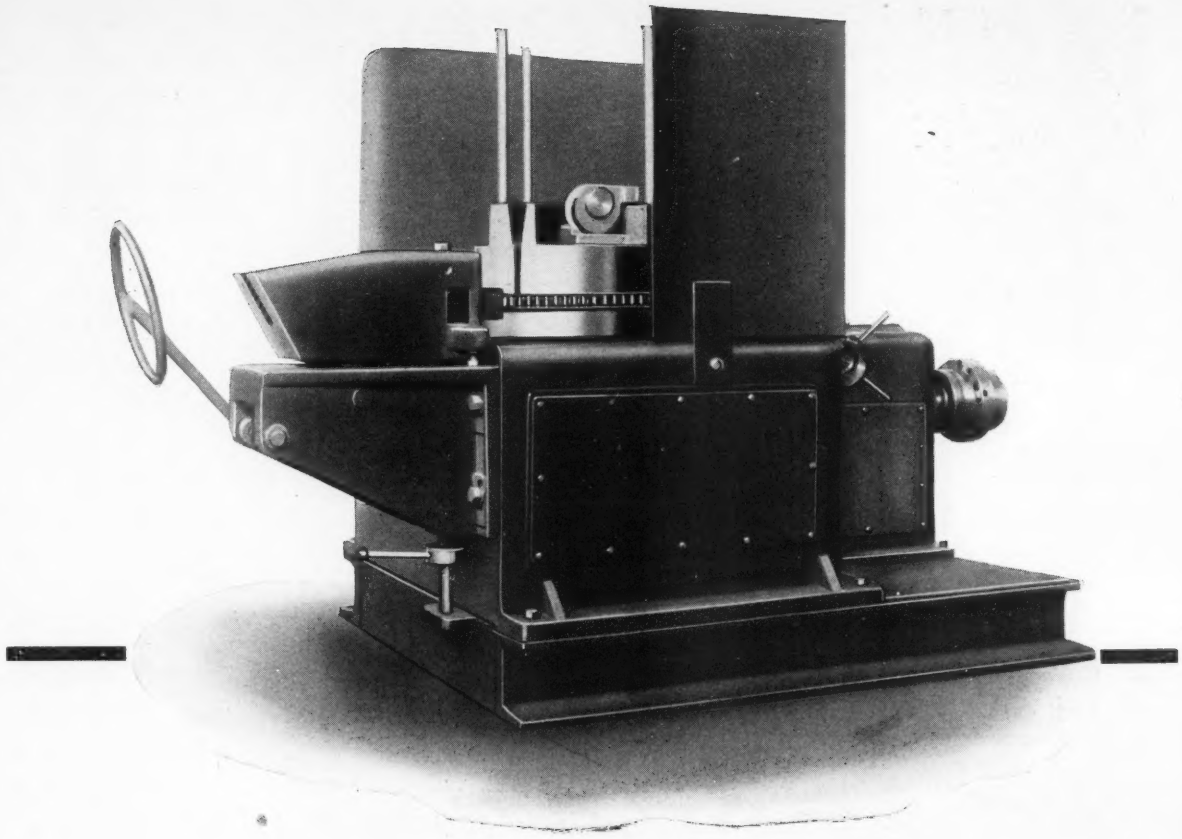

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WIRE & WIRE PRODUCTS

300 Main Street • Stamford, Conn.

Official Publication of the Wire Association

On a seamless pipe mill J&L men turn out shatter-proof steel for gas-bottles to protect our fighting men.

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FROM AN ORIGINAL DRAWING BY ORISON MACPHERSON

INDUSTRIAL TEAMWORK SAVES LIVES ON BATTLE FRONTS

Fearless newspaper writers, risking their lives aboard our naval vessels, bring us living accounts of the heat and fury our sailors face in battle to defeat the enemy. Flying pieces of enemy shells, smashing bomb fragments and piercing bullets from diving planes leave no area, passageway, deck or hold immune from danger. Even the steel gas-bottles of carbon dioxide carried aboard for fire fighting may be hit. These gas-bottles must be shatter-proof, otherwise they themselves would explode like bombs, dealing death and destruction to men and equipment they are designed to protect.

Early in the war the Navy took the problem of developing a shatter-proof gas-bottle to a mid-west manufacturer who in peacetime made creamery equipment. This company in turn came to J&L to develop the special steel needed. From long experience in producing high pressure steel pipe, J&L promptly made experimental tubes of special steel and developed a strength-building heat treating procedure. From these tubes sample bottles were made and tested with 1.1" armor piercing shells at a 50-yard range on an ordnance proving ground. The steel was shatter-proof. The problem was solved. Today J&L's big seamless pipe mills are producing this new tubular stock for making gas-bottles that safeguard the lives of our fighting men.

This is another example of the teamwork between the armed services and industry, with management, scientists and skilled workers doing the miraculous for our armed forces, supplying them with superior equipment that guards their lives and enables them to crush the enemy.

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ARMY E NAVY

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JONES & LAUGHLIN STEEL CORPORATION

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J&L STEEL

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FOR DRAWING	For drawing fine wire, heavy wire, special shapes, tubing, etc. For shell and cartridge cases from the blank to completed case.
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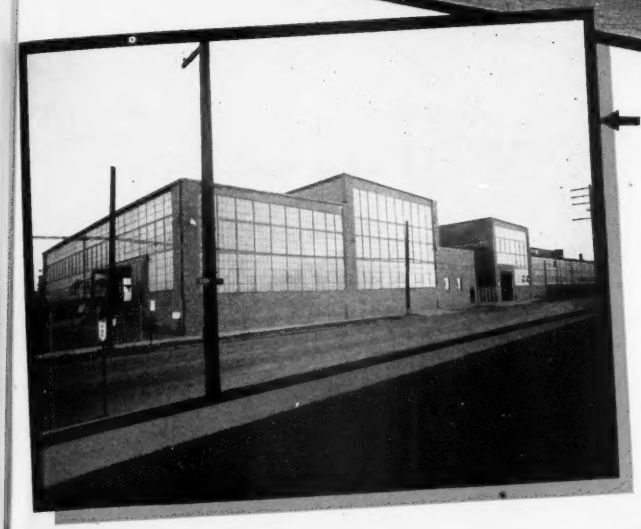
East and west view of Broden-Wean plant



Partial view of assembly shops

THE Wean Engineering Company, Inc., have long been recognized as Specialists in sheet, strip and tin mill equipment » » » The Broden Construction Company specializes in the manufacture of narrow strip and wire mill equipment.

The expansion of the facilities of The Broden Construction Company as a subsidiary of The Wean Engineering Company, Inc., is indicated in the accompanying photographs, and makes it possible to serve the steel industry more effectively.

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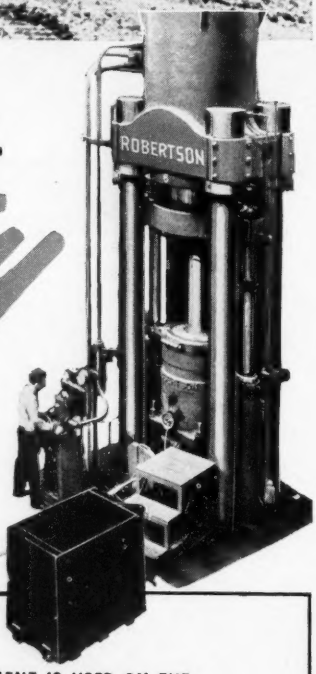

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Chicago PALMER HOUSE **October 18 thru 22**

America's metal industry will move its "base of operations" to Chicago's Palmer House the week of October 18 to take full advantage of the 25th annual National Metal Congress and War Conference Display.

Devoted to increased production of war products, to conservation of materials, and to postwar planning, this year's Congress and Conference Display will bring vital new developments and ideas to the attention of thousands of war production executives and engineers in the metal industry.

More than a hundred technical lectures will be presented by the four cooperating societies. Leaders in the metal industry and government will participate in the Special War Production and Conservation Sessions held each day by the American Society for Metals, sponsor of the event.

Hundreds of manufacturers will participate in the War Conference Display to be held in the Palmer House itself. These companies will have their engineers, their literature, light equipment and parts at these Conference Display rooms to help metal men solve their problems and increase production.

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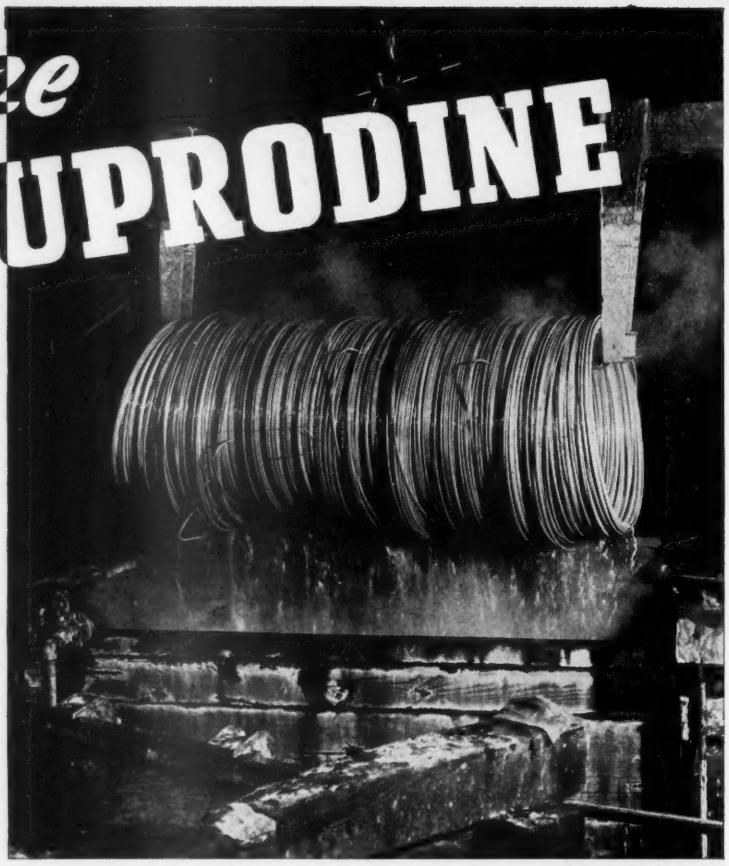
NATIONAL METAL CONGRESS AND WAR CONFERENCE DISPLAY

Under the direction of the American Society for Metals, in cooperation with the American Welding Society, the Wire Association, and the Institute of Metals and Iron and Steel divisions of the American Institute of Mining and Metallurgical Engineers.

Cuprodize with CUPRODINE



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  Increased Production
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AMERICAN CHEMICAL PAINT CO.
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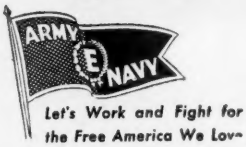
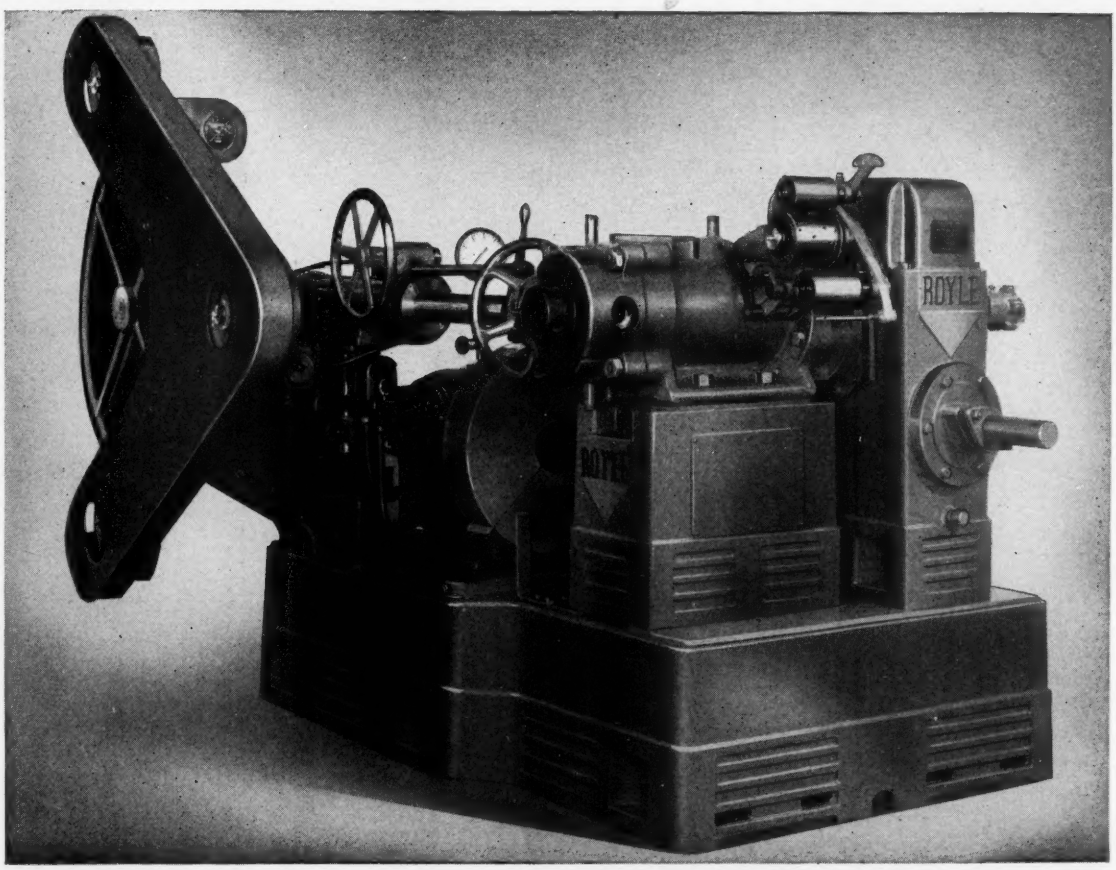
ROYLE EXTRUDERS



used in the manufacture of covered wire, contribute a generous share to the spider web that constitutes the basis for both military and civilian systems of communication.



THE ROYLE CONTINUOUS VULCANIZING ASSEMBLY

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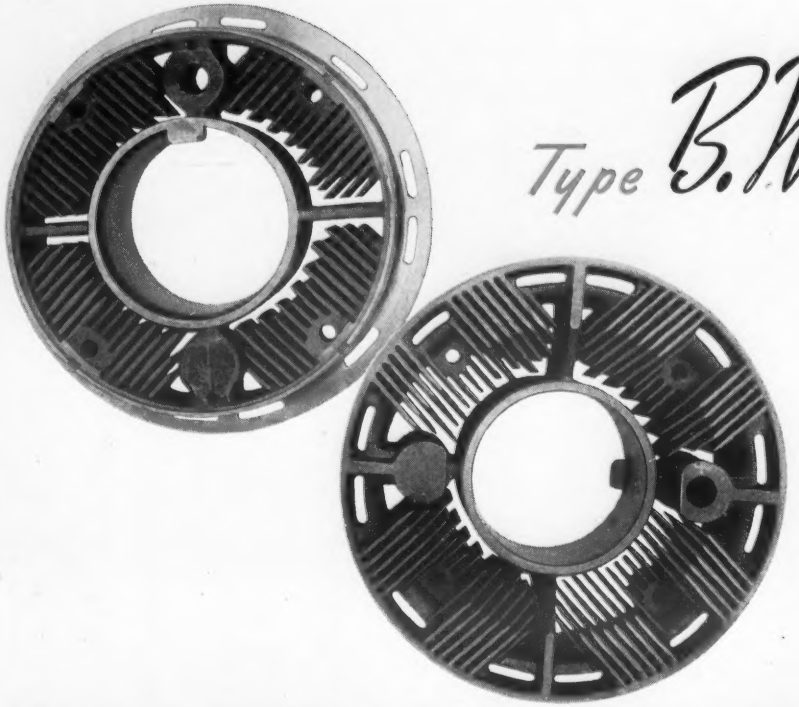

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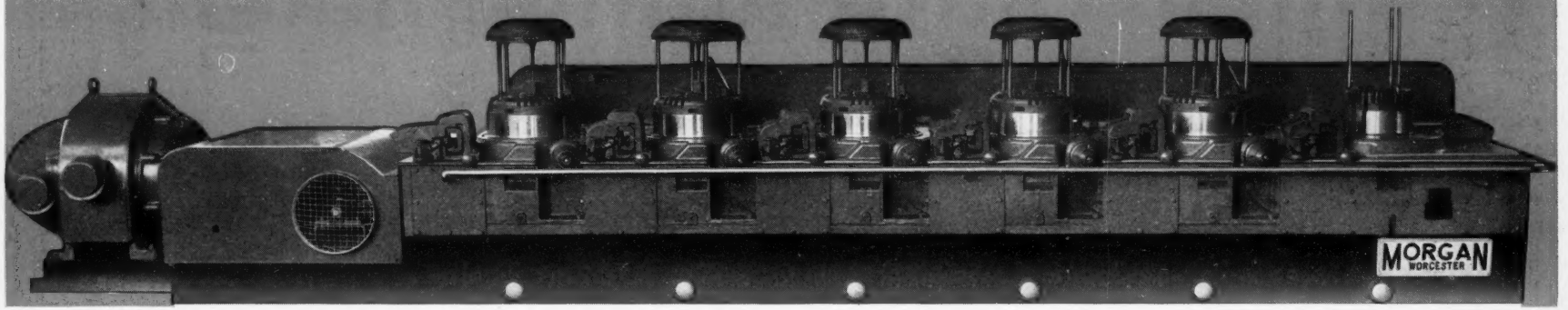
MORGAN-CONNOR WIRE MACHINES



WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 18 SEPTEMBER, 1943 No. 9

Designated as

Official Publication By The Wire Association

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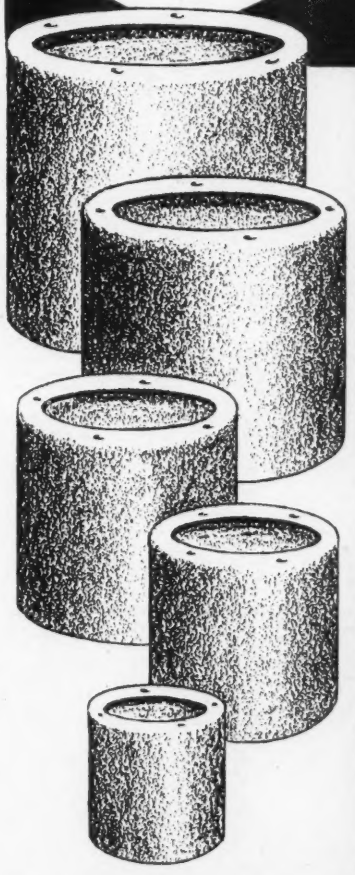

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WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
Wire Products and Insulated Wire and Cable.
DRAWING --- ROLLING --- EXTRUDING --- FORMING --- FABRICATING

Vol. 18 SEPTEMBER, 1943 No. 9

The Importance of Wire In War

By Edmund D. Sickels

Advertising Manager,
Wire & Wire Products, Stamford, Conn.

THERE are some 12,000 different kinds and sizes of wire, having in normal times 160,000 to 180,000 applications, it has been variously estimated. Wire is used in the construction of plants in which is manufactured war equipment — guns, ammunition, tanks, trucks, ships, planes, radio and radar equipment, and so on, and then is used as integral and vital parts of the products of these plants themselves in innumerable ways.

✦ ✦ ✦

MILITARY bases, airplane landing fields, camps, have to be constructed with the help of wire. The fighting forces use wire for communication, for defense and in offense. Combat units keep in constant touch with headquarters by telephone and radio equipment, they set up barbed wire entanglements to delay enemy movements, place mines and booby traps to do damage to the enemy, protect cities from bombing attacks by sending up balloons attached to wire cable, protect harbor entrances with wire, sweep water routes clear of mines and camouflage military objectives with forms of wire.

The importance of wire in the war effort can perhaps best be emphasized by stating as a general proposition, that no military or naval mechanism can function without wire, and that no branch of the armed services could operate effectively without it. ✦ ✦ ✦ ✦

EDMUND D. SICKELS
Advertising Manager
"Wire & Wire Products", Stamford, Conn.

IN its specific uses wire has many ramifications. Wire rope and cable may be found in military and industrial applications as wide as industry itself. There are 1500 sizes and types, each engineered for a particular purpose. A common type, as an instance, the 6 x 19 fibre center rope—six strands of nineteen high carbon steel wires built around a fibre core, which acts as a cushion and a lubricant reservoir, contains 119 parts. Such cable will be used in construction work, mining operations, in the petroleum industry, in building military roads, logging and on similar operations.

✦ ✦ ✦

CABLES go into airplanes, mobile ground units, ships, undersea craft, ordnance pieces as operating controls, material handling equipment, mooring apparatus, and so forth. In 1942 60,000 airplanes were scheduled for production—45,000 combat planes and 15,000 trainer units. Each plane contains from 250 to 5000 feet of

Designated as Official Publication by the Wire Association

wire rope, depending on size and type. At an average of 1000 feet per plane, 60,000,000 feet of wire rope were required for the operation of the combat planes made last year.

✦ ✦ ✦

SOME of the equipment on which wire cable is used directly and indirectly in the war effort include aerial tramways, derricks, hoists, drills, pile drivers, cranes, bomb hoists, slings, pontoon bridges, rigging, anchors, bulldozers, winch trucks, life boat falls, and wire rope is used for towing, mooring, torpedo nets, barrage balloons, airplane launching and arresting, for parachute rip-cords and elsewhere. One concern reports that it is supplying approximately 200 different types and constructions of bare, insulated wires and cables to various branches of the Army, Navy and Air Corps, each designed for a specific end use.

✦ ✦ ✦

INSULATED wire and cable is another important classification of wire, of which astronomical quantities are produced. The Signal Corps is the largest single user of wire. This is used for communication. While no statistical information is issued by the Government on the quantities made for the Signal Corps, it is generally understood that some 3,000,000 miles of this item was on order in 1942. As this is insulated seven strand cable covered

Fig. 1. Reel cart used by the Field Artillery in laying their communication wires. ✦ ✦

with rubber or a synthetic plastic, this length represents some 45,000,000 miles of wire—enough to reach from here to the moon and back eight and one-half times.

✦ ✦ ✦

AS a side light on field communications, our Army is the only one to use a two-wire telephone field wire from which messages cannot be intercepted. One concern has developed a "Laytex" coating for this wire that effectively seals out water and, consequently, noise. A thousand miles of this wire requires only 2½ tons of the insulating material, greatly reducing the quantity of rubber formerly required for the same purpose.

✦ ✦ ✦

A LIST of the Army and Navy's types of conductor wire would cover practically every phase of activity involving electricity. Some of these follow:

Ten-Pair Field Telephone Cable with Connector for field communication between Army and Division Headquarters.

Five-Pair Field Telephone Cable with Connector for field communication between Army and Division Headquarters.

Spiral Four Cable with Connector for field communication between Army and Division Headquarters, especially for distances greater than 30 miles.

Assault Wire for field communication from Regimental Headquarters to outposts.

Field Telephone Wire for field communication between Division and Regimental Headquarters.

Fire Control Cable for control circuits on anti-aircraft gun systems.

Fire Control Cable for power supply on anti-aircraft gun systems.

Searchlight Control Cable for control circuits on aircraft searchlight systems.

Searchlight Power Cable for power supply to aircraft searchlight systems.

Degaussing Cable for demagnetizing ships.

Portable Cable for signal and lighting circuits aboard Navy Ships.

Airtrack Cable for control circuits on automatic landing equipment.

Demolition Charge Cable for mine leads.

Cordage for radio equipment connections on tanks and trucks.

Welding Cable for welding circuits aboard Navy Ships.

Non-Metallic Sheathed Cable for power and lighting in barracks and other military buildings.

Building Wire for power and lighting in barracks and other military buildings.

✦ ✦ ✦

SPRINGS go into every conceivable mechanism used in the war. They close the valves in plane, truck, tank, jeep, submarine, destroyer, cruiser and other internal combustion engines. They are used in instruments,

Fig. 2. Soldiers of the 56th Engineers erect wires. ✦ ✦
(All Photos on This Page by U. S. Army Signal Corps)

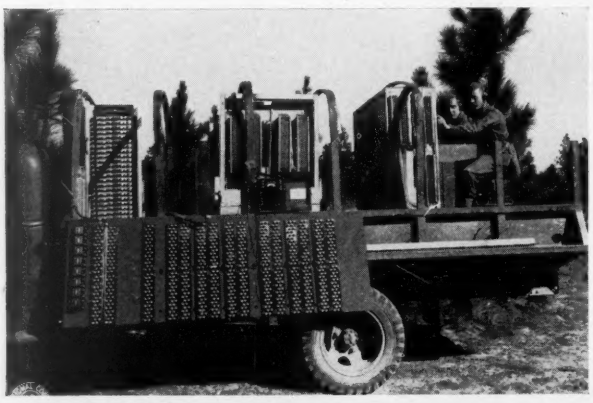

Fig. 3. One of the mobile telephone switchboards of the 64th Signal Battalion. ✦ ✦ ✦ ✦ ✦ ✦

parachutes, machine guns, automatics, bombs, gun carriages, recoil apparatus on heavy ordnance, torpedoes, and to carry the loads of many varieties of mobile land vehicles. An interesting development is the beryllium copper spring, now used widely in airplane instruments. Precision made, these valuable springs can be used wherever there is a wide variation of operating conditions, without mechanisms to compensate for temperature changes. Even the lowly cot upon which the Army sleeps in cantonments and the bunks in naval vessels are provided with springs.

Fig. 4. Radio Communication Car is observing the advance position before going ahead.

✦ ✦ ✦

WHILE springs of brass, copper, bronze and steel have manifold uses, the mention of a few additional applications will serve to illustrate the variety of roles for springs: hood assemblies in tanks, machine tool mechanisms, holding and releasing mechanisms for bomb loaders, upholstery springs in chairs for officers' quarters, door springs for munition chargers, trainer planes, glider towing connections and brake release mechanism on trucks.

✦ ✦ ✦

MANY concerns are using huge quantities of insulated electric wire in the manufacture of motors and generators, which have both direct and indirect war-time applications. Generators supply power for the operation of factories, for the movement of machinery, equipment, supplies and troops by rail, for lighting of homes, plants and business offices. Motors, from fractional H.P. to heavy duty industrial power units, operate machinery, locomotives, instruments, control mechanisms on ships, planes, heavy ordnance and in every place where actuation of moving parts can be done more speedily and accurately by power than by hand.

✦ ✦ ✦

LAMPS, searchlights, electronic tubes, radar equipment, landing field beams, all utilize wire as the basic element around which the equipment is built. At the outbreak of the war radio and radio parts manufacturers were dismayed to find that government orders were estimated to amount to only $90,000,000 per annum — a fraction of the existing civilian radio volume. Today government orders for radio and radar equipment greatly exceed the former radio volume, and every concern capable of manufacturing parts or equipment to the exacting specifications required by the Army, the Navy or the Government for Lend-Lease needs, has more business than can be handled comfortably.

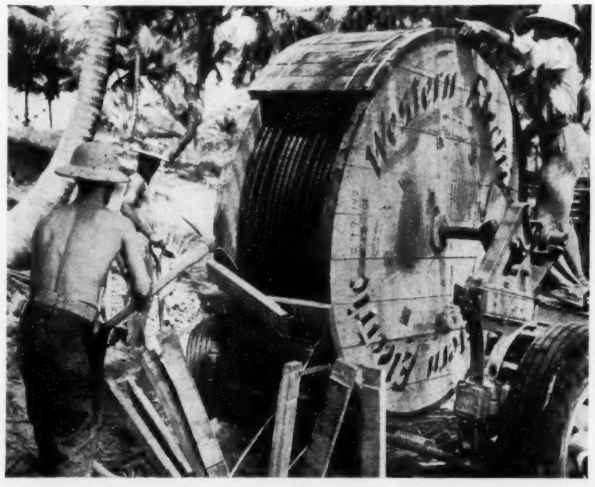

Fig. 5. Removing the outer casing from a reel of cable, for use in the laying of the new submarine cable at Puerto Rico. (Photos by U. S. Army Signal Corps)

✦ ✦ ✦

THE greatly expanded use of welding has brought about a tremendous development in the production facilities for making welding rods, and a great increase in the variety of metals and coatings used in this connection. The war has pushed the science of welding decades ahead, so much so, that the post-war period will see a continued use of welding to a degree not thought of two years ago.

✦ ✦ ✦

THE growth in the use of welding rods, has been paralleled by the development of more and better welding cable and power cable for welding machines by means of which welding rods can be utilized.

✦ ✦ ✦

APART from its large use as conductors for current, nonferrous wire has found its way into numerous war products. Rivets are used in rifle tie plates and in bomb and fuse assemblies. Springs are used in primer heads, wire is used for grenade pulls, zippers for aviation equipment, antenna, radio assemblies, fire control apparatus, detonators, degaussing cables, underground cables for lighting airports, and in hundreds of other widely divergent cases.

✦ ✦ ✦

STEEL wire is also used as a conductor for the transmission of electric power. The shortage of more critical metals focused attention on the practicability of utilizing steel, with the result that a high-tensile, low-resistance, galvanized steel conductor, which, used with a

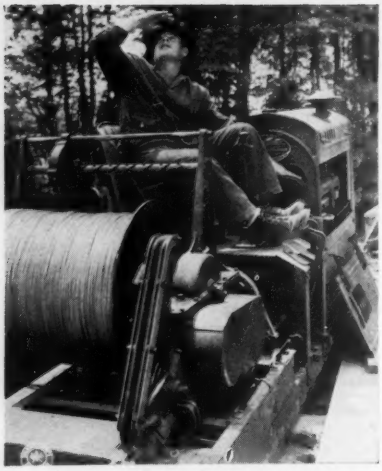

Fig. 6. Giant Spool of Sky Thread—Here is shown the motor driven winch which winds and unwinds the steel cable controlling the flight of the barrage balloon. (Photo by U. S. Army Signal Corps) ✦ ✦ ✦ ✦

60 cycle alternating current, has shown remarkable efficiency, besides permitting spans of as much as 350 feet between supports.

✦ ✦ ✦

COTTON covered wire cloth targets towed by airplanes are used to give our future gunners practice in shooting enemy aircraft out of the sky. To record the effectiveness of this training, each pilot's bullets are coated with different colored paints, which upon hitting the target, leave colored rings. A special type of wire cable is used in all automotive vehicle and airplane tire beadings. One tire for a giant bomber alone requires 15,000 feet of steel wire. Card and napper clothing wire is employed in the weaving of blankets, tents and uniforms for our armed forces. Not very often thought of in connection with war, are the little pre-formed staples for desk use by officials of our armed services. For industrial purposes the same type of staple, in varying sizes, is used for fastening insulation, screens, and so forth in Army camps, for constructing bomb shelters, gas masks, camouflage and the like. Stitching wire is used for packaging TNT and dynamite and foodstuffs, and even bookbinding wire gets into the war effort in stitching pamphlets, instruction books, war stamp books and ration books. One manufacturer of shaped wires has succeeded in drawing, from round wire, an intricate shape that is cut into proper lengths and used as rear rifle sights. This same company draws wire in shape of toothed gears. The wire is cut at the desired points and gears not requiring too great precision result, which are used in instruments and elsewhere. In normal times, such gears are used in the manufacture of clocks. The foregoing scattered examples of wire uses serve to illustrate the diversity of its applications.

✦ ✦ ✦

WHILE no list can be complete, following is a tabulation of places where steel wire is found in war products, some of which have been referred to previously:

Cartridge clips
Reinforcement for rubber tank treads
Parachute rip cord rings
Reinforcement in plane and combat car brake linings
Screens for grading powder
Tow targets
Filter screens for fuel
Welding rods

Fig. 8. The M-4 medium tank, complete with armament a 75 mm. gun and an imposing array of machine guns—is shown here. The tank is completely streamlined has the 75 mm. gun in the center instead of on the right side as in the M-3, is lower in silhouette, has an all-cast body instead of riveted, and weighs about the same, 30 tons. The turret, with the 75 mm. gun, turns 360 degrees. (Official U. S. Army Photo) ✦

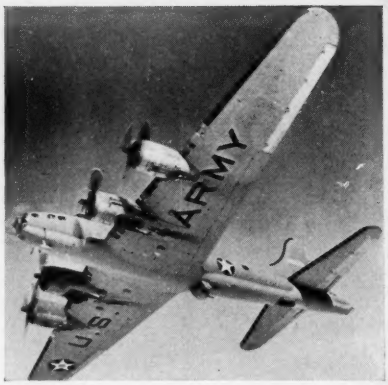

Fig. 7. Boeing B-17E. (Official Photograph U. S. Army Air Force) ✦ ✦ ✦

Rivets for hull construction
Rope
Telephone lines
Rim wheel bolts for Army trucks
Power transmission lines
Tappets for truck engines
Handles on ammunition lockers
Pins on anti-aircraft gun carriages
Pins and screws on machine guns
Aircraft bolts
Steel wool for cleaning guns
Reinforcing mesh for military roads
Hooks on carriages of machine guns
Binding wire for packaging food
Reinforcement of aluminum and magnesium casting cores
Hinges on ammunition cases
Spark plugs
Chains for the Navy
Socket wrenches and screw drivers
Time fuse parts
Electrical switch parts
Army cots—spring and link wire
Army kitchen utensils
Barbed wire for all branches of the service
Nails for the construction of cantonments, airfields, etc.
Property protection fences
Camouflage mesh
Utility mats for landing strips, truck haulways, etc.
Fragmentation shelters
Igloo reinforcement construction
Concrete pipe reinforcement (cantonments)
Hauler and towing cables
Barrage balloon cables
Flare cables
Control cables
Tiller cables
Hoisting rope
Truck skid chains
Mine sweeping nets
Sounding wire
Signal Corps wire
Belt buckles
Armor piercing bullet cores
Baskets to contain shells
Insect screens
Partitions
Tool bins
Paymaster cages
Camp screen door guards
Bolts, rivets, cotter pins
Control rods
Reinforcement for bullet proof gas tanks

(Please turn to Page 540)

JULY, 1943

WIRE AND WIRE PRODUCTS

Says:

Aluminum Rivet Production Exceeds Consumption

THE nation's facilities for producing aluminum rivets have been developed to such an extent that, temporarily, maximum capacity is greater than current consumption. However, with the expanding aircraft program it is expected that within a few months consumption will exceed production.

Firthaloy MADE IT POSSIBLE!

Here is **another** instance where FIRTHALOY Dies are helping to keep production **ahead** of demand. The aluminum-rivet industry has standardized on FIRTHALOY Dies about 100%. **Continuous operation** of machines is made possible by FIRTHALOY'S long life. **Rejects are held almost to nil** because of FIRTHALOY'S sustained accuracy.

FIRTHALOY—THE STANDARD CARBIDE

ARMY E NAVY

Firth-Sterling STEEL COMPANY

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The Importance of Limestone and Its Products in the Manufacture of Iron and Steel

By D. E. Washburn,
Chief Chemist, American Lime & Stone Co.,
Bellefonte, Penna.

Attention is called to the many uses of limestone and its products in the processes relating to the manufacture of iron and steel and to its essential use in connection with the war effort. ✦ ✦ ✦

THE importance of the manufacture of iron and steel to the wire drawing industry is self evident, and this article will be read for the most part by those whose interest in lime is principally concerned with its application to lime coatings where the amount so employed is rather insignificant as compared with the enormous tonnage of lime and limestone employed in the direct manufacture of pig iron, steel, special steels and incidental applications so important to the successful and economic production of iron and steel.

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THOSE interested in the rather restricted use of lime for coatings are apt to give little thought to the vast importance of lime and limestone in the role it plays in supplying the wire drawing industry with metal.

✦ ✦ ✦

ANY virtue possessed by lime and limestone hinges on the fact that they are basic materials as opposed to acidic substances. Some people think of acids only as liquids, and fail to visualize the silica in sand, and alumina in clay and a number of other mineral substances as acids. True, these mineral substances are not acid to the taste like vinegar or lemon juice, but under proper conditions they will react with bases such as limestone just as surely as do the liquid acids, and for this reason limestone displays its importance in the very first scene in the opening act of the drama of pig iron. Here the limestone under high temperatures is converted into calcium oxide which in turn neutralizes all the acidic minerals in the ore, coke, etc. to form liquid slags that float on the heavier liquid metal, facilitating the separation of the two. Pig iron production depends on the lime in limestone removing the unwanted thrash, including the partial removal of sulfur, phosphorus, silica, etc., and the most effective removal of these unwanted items from the pig iron will help leave a minimum to be removed in later processing pig and scrap into steel.

✦ ✦ ✦

WHERE pig molding machines are employed, lime, of course, is made into a white wash and applied to the inside of the molds in order to prevent sticking.

✦ ✦ ✦

BY some it is claimed that dolomitic limes give a less mottled appearance to the surface of the pig than do high calcium limes, thereby lessening sales resistance where the pig is sold for foundry use. It seems that a mottled surface is sometimes indicative of an excess of certain impurities. At any rate the lime, whether dolomitic or high calcium, serves a highly important purpose in permitting machine molding to do the work which otherwise would have to be done by costly hand labor.

✦ ✦ ✦

IN open hearth and electric furnace practices, the same neutralizing property which manifests itself in the production of pig iron, again acts to help convert the rather crude metal into a refined steel. Both limestone and lime are here employed. Some open hearth operators charge limestone and some burned lime directly into the original charge, depending on whether or not hot metal is employed. At the finish of the "heat", lime is invariably used to help in giving the finishing touch to the refined product. Electric steel production also depends on lime to help similarly in the refining process, and incidentally the demand is for a quick lime with very low combined moisture to per cent hydrogen formation.

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BLAST furnaces require large tonnages of coke so that coke plants are often closely associated with pig iron production and open hearth steel production. Here lime plays an important part in recovering ammonia from the liquors condensed from coke oven gasses. It is hardly necessary to emphasize the importance of the recovery of

(*Please turn to Page 530*)

Steel Wire
Its Manufacture and Properties
— A BOOK REVIEW —

By F. R. Morral,
Industrial Fellow, Mellon Institute of Industrial Research,
Pittsburgh, Pa.

The scarcity of books speaking with authority on the production of steel wire impelled the author to search for material in other languages. The Review of the book by A. Pomp presented herewith is a result of that research and should be of interest to the industry.

THE subject of steel wire has been neglected by American writing engineers. In the last 20 years only two original books have appeared in the English language. **H. Dunnell** on "British Wire-drawing and Wire Working Industry" (1925) and **A. T. Adam's** "Wire Drawing and the Cold Working of Steel" (2nd. ed in 1936). The French book by **M. Bonzel** (1934) has been translated into English, by **Kenneth B. Lewis**, of Worcester, Mass. Other texts in French have been written by **G. Soliman** (1924) **R. Papier** (1925) **G. de Lattre** (1927). Books in the German language have been written by **H. Alpeter** (1926) **M. Boerner** (1929) and the most recent, the book which will be abstracted below, written by **Anton Pomp** (1941).

✦ ✦ ✦

THE author, **A. Pomp**, has been associated with the Kaiser Wilhelm Institute für Eisenforschung. His papers on the theory of wire drawing listed in the bibliography are 22 in number and they cover the period from 1921 to 1938; in addition he has written sections for handbooks and several pamphlets on the subject.

✦ ✦ ✦

THE first third of the book covers generalities and fundamental principles of wire drawing from a theoretical and scientific standpoint. In a short introduction the reason for cold drawing rods are given: to reduce the diameter, to secure accuracy of roundness or shape, a smooth surface, and last but not least, the importance of imparting to the material the desired engineering properties.

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A SHORT historical sketch is followed by a chapter on the raw material: type of rods (round, square, etc.), diameter of rods, weight of bundles, types of steel used, specifications on roundness and size. The various defects present in rods, e. g., lack of roundness, surface defects and steel defects are both discussed and pictured. The finished product must have certain physical properties, requirements of customers make it necessary to straighten it and cut it, deliver in spools and to give it various surface finishes (zinc, tin, etc.). Some German specifications (DIN) data sheets are reproduced. The various gauges used, namely the Birmingham, Imperial Standard, American Steel Wire, Jauge de Paris and the millimeter scales are compared in one table (p. 21-22). Instruments used in the shop (split gages and micrometers) and in the laboratory for more accurate work are mentioned briefly.

✦ ✦ ✦

CHAPTER IV deals with the preparation of the rod previous to drawing: a) the various machines used to point the rod b) removal of oxides by mechanical methods or by pickling in sulfuric, muriatic acid, etc. This last subject is discussed at some length as well as hydrogen embrittlement and the use of inhibitors. Practical hints are given for analytical control of pickling baths, pickling house arrangement, equipment and disposal of pickling liquor. The Tainton process is mentioned among the electrolytic pickling processes. The pickled rods are washed and dipped in lime water, they may be allowed to sull and then dried. Reference is made to the instantaneous driers used in this country.

✦ ✦ ✦

CHAPTER V deals with the fundamentals of drawing, presents views on the mechanism of deformation in metal and the X-ray diffraction evidence are presented. In the following fields Pomp and his coworkers have obtained some interesting information which is briefly summarized in the book: the distribution of stresses on the wire as it goes through the die; the force necessary and the work done to draw wire is calculated mathematically and compared with data on experimental results. Reduction per draft limit to prevent tear. The working conditions

*Stahldraht. Seine Herstellung and Eigenschaften, Verlag Stahleisen m.b.h., Dusseldorf. 275 pages with 265 figures and 18 tables.

for drawing wire considering pull, the resistance to change of shape, the ability to deform and the degree of strain are discussed in the light of the work of the author and his coworkers. The influence of the angles of the bearing surface of the die and between the die and the wire are important from the standpoint of power requirements which may be deduced theoretically and have been confirmed. The work done by the author in this field is illustrated in detail. The hardness of the die has a decided effect on the pulling force necessary (tungsten carbide dies require only 40-50 per cent the force necessary with steel dies). The ability to change the shape is greater with hard dies particularly for high carbon steel. Hardness is not the cause of these effects. These dies have a greater polish and therefore friction is less.

✦ ✦ ✦

LUBRICANTS in drawing have been extensively studied by Giraud, Pomp and others. The effect of speed of drawing has not been settled. Certain experiments seem to indicate that the necessary pull is less at higher speeds, other authorities can find no effect. Data up to 1500 ft. p.m. is presented in graphs.

✦ ✦ ✦

AS the change in section per draft increases the necessary pull becomes larger, but on the other hand, the power per unit reduction decreases. High temperatures on drawing appear to be detrimental because of the destruction of the thin film of lubricant between the die and the wire. The effect of reactive drawing and the effect of the use of rotating dies are discussed briefly.

✦ ✦ ✦

THE mechanism of the deformation occurring during drawing has interested several scientific workers.

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FROM the material in this chapter (V) the author draws conclusions for the better practical technique in wire drawing, most of which are already in use.

✦ ✦ ✦

THE profound changes of properties of steel wire due to drawing are taken up in the next chapter, under the headings of tensile strength, bending, twisting, and endurance. The influence of the conditions inherent to drawing, such as lubricant, die material, die angle, number of passes, speed, temperature, direction in which wire is drawn, aging and heat treatment (annealing, and tempering) are dealt with successively. The flow curve for drawn wire, changes in metallographic structure, changes in density, acid solubility, electrical and magnetic properties, and welding properties produced by the drawing are analized for various types of steel wire.

✦ ✦ ✦

PAGES 97 to 234 deal with production of steel wire. A general classification of equipment into wire and draw benches, is followed by detailed presentation to take off reels and flippers, grippers, safety rings fastened on the bench, including both ripping and finishing frames. Tables of characteristics of the Morgan-Connor, 3, 4, 5, 6, and 7 block benches are given. Spooling machines, wire welding, bundling of scrap wire, conveyor means, and draw benches for heavy sections are discussed next and many of them illustrated.

✦ ✦ ✦

DRAWING dies are discussed in chapter VII. English, German, and Viennese: single hole dies of steel, diamonds, high alloy, and carbide type dies have their appropriate applications. Present requirements make necessary accurate measurement of die holes. This material is followed by a discussion and presentation of data on lubricants, greases and oils for dry and wet drawing.

✦ ✦ ✦

ANNEALING, its purpose, its effect on low, medium, high carbon and alloy steels is the subject of Chapter X. The effects of improper annealing are coarse grained recrystallization, burning, surface decarburization and graphitization. This operation may be done batchwise or continously. Furnaces used in Germany and the bell type furnaces used in the U. S. A. are illustrated. Bright annealing is done in molten salts, in pots and with controlled atmospheres. The fundamental principles of patenting may be explained by Davenport and Bain's "S" curve; changes in microstructure, effect on the drawability of the wire, influence of carbon content and conditions of patenting are all correlated with the tensile properties of the wire. Data is presented on the above as well as influence of furnace temperatures (air patenting) lead baths, quenching medium, and speed of wire. The steps necessary in the production of special wire (rope wire and piano wire) are analyzed.

✦ ✦ ✦

DIAGRAMS by Püngel and a slide rule by Wiegert are reproduced and their use to calculate the procedure to be followed in the production of drawn steel wire is explained. Defects produced by patenting at too high or too low temperature are discussed. Batch and continuous furnaces are used for patenting; they may be heated by gas or electricity; further, the wire may be patented by electrical resistance heating. Sketches illustrate the various types of furnaces and reference is made to an American type of furnaces.

✦ ✦ ✦

SOME of the wire produced requires hardening and tempering. Chapter XII takes in succession the purposes of hardening, methods to accomplish it, what occurs on hardening, hardening temperature, time at temperature, cooling velocity, effect on microstructure, normalizing and tempering.

✦ ✦ ✦

THE differences between tempered and patented wire is discussed in view of the breakage which occurred at the Mount Hope

(*Please turn to Page 532*)

THE WIRE ASSOCIATION — 1943

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THE Wire Association is a non-profit organization of wire mill executives, superintendents and foremen. It also includes plant engineers, traffic men, and all others engaged in the production of cold drawn bars, rods, wire, strip, insulated wire and cable, and the manufacture and fabrication of finished wire products, including cold headed, extruded and other cold worked metal products.

THERE are separate divisions for all the separate major interests in the wire industry, steel, iron, brass, copper, alloy, and precious metals, together with divisions relating to drawing, cold working, cold heading, extruding, fabricating, forming, spring making, wire cloth, wire rope, bare and covered electric wire and cable and all other forms of wire and wire products.

✦ ✦ ✦

PURPOSES

ITS specific purpose is to improve production methods and afford a clearing house for ideas on management problems, technical problems, and research work in all phases of practical wire drawing and wire working, and to develop and maintain friendly relations among the members.

✦ ✦ ✦

ACTIVITIES:

The Association functions along the following lines:

1. The use of the Association headquarters as a central clearing house for information and data of all kinds which may be of interest to members.
2. The exchange of ideas on processes of production including machinery, technical processes, etc.
3. The establishment and maintenance of friendly relations among the members of the association and the development of sectional and national meetings to discuss matters of mutual interest.
4. Studies of production methods and analysis of production costs.
5. Developments in the use of new materials and new applications of existing materials and by-products.
6. Research and collection of information on personnel management, including such factors as labor turnover, seasonal changes in the demand for employees, wage scales, etc.
7. Standardization and simplification as a means for the effective elimination of waste.
8. Such other subjects as may be determined upon.

PROGRAM

Wire Association Wartime Emergency Convention

Chicago, Illinois, October 18-22, 1943. Association Headquarters--Hotel LaSalle

The Exposition and Show of the National Metal Congress Will Be Open from Monday to Friday Inclusive, All Day and Every Evening During the Week Except Thursday Evening.

\+ + +

Wire Association Headquarters at The Hotel LaSalle Will Be Open From 10:00 A. M. to 11:00 P. M. During the Entire Convention—Come and Get Acquainted!

\+ + +

THERE WILL BE A REGISTRATION FEE OF $5.00 FOR THOSE ATTENDING THESE TECHNICAL SESSIONS AND INFORMAL MEETINGS

\+ + + ADMISSION WILL BE BY BADGE ONLY + + +

Open Discussions Will Be Held On the Papers Presented and These Discussions Will Be Published in the January, 1944, Issue of Wire and Wire Products

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A. R. Zapp, Manager, Firthaloy Div., Firth-Sterling Steel Co., McKeesport, Penna.

The Technical Sessions End Thursday in Order that Friday May Be Available To Make A Thorough Inspection of the National Metal Exposition at the Palmer House

Hotel reservations may be made by members of The Wire Association direct with the Hotel LaSalle prior to October 10, 1943. ***Watch out for this—Make your plans now to attend and send your reservation card in promptly.***

MONDAY, OCTOBER 18

10:30 A. M.
DIRECTORS' MEETING

12 NOON
PROGRAM COMMITTEE LUNCH

Registration and Information. (Mezzanine of Hotel LaSalle) — October 18-22 — in charge of Mrs. R. S. Spengel, Secy.-Treas., WIRE & WIRE PRODUCTS.

— The Technical Sessions —

ALL RESEARCH PAPERS ARE PREPRINTED IN THE OCTOBER ISSUE OF WIRE AND WIRE PRODUCTS

The Discussions and the Mordica Memorial Lecture Will Be Printed in the January, 1944 Issue of Wire and Wire Products

MONDAY, OCTOBER 18

Afternoon Session — 2:30 P. M.

	E. W. Gundstrom, Asst. Plant Manager, Chairman of Meeting	Rome Cable Corporation, Rome, N. Y.
OPENING ADDRESS	Carl E. Johnson	President of the Wire Association
LECTURE: "Designing Mills for Government Purposes"	Paul M. Mueller,	Revere Copper & Brass Company

No preprints of this lecture will be available.

LECTURE: "Training in Work Simplification"	Allan H. Mogensen, Editorial Staff	"Factory"

This is an explanation of work simplification by the use of moving pictures.

TUESDAY, OCTOBER 19

Morning Session — 9:30 A. M.

	R. B. Whyte, General Superintendent, Chairman of Meeting	MacWhyte Co., Kenosha, Wis
PAPER: "Steel Rope Wire Drawing Practices"	John C. Aiken, Assistant Superintendent Rod & Wire Dept.,	Jones & Laughlin Steel Corp., Aliquippa, Pa.
PAPER: "Graphical Solutions of Wire Mill Mathematical Problems"	E. J. Crum, Galvanizing Foreman, Rod & Wire Department,	Bethlehem Steel Company Sparrows Point, Md.

TUESDAY, OCTOBER 19

Afternoon Session — 1:30 P. M.

	Fred M. Crapo, President, Chairman of Meeting	Indiana Steel & Wire Co., Muncie, Ind.
PAPER: "The Use of Lead Base Coatings as a Substitute for Zinc"	C. A. Kellogg, Chief, Dept. of Metallurgy and Inspection,	Continental Steel Corp., Kokomo, Indiana
PAPER: "Hydrogen Brittleness in Spring Steels"	Rodman R. Tatnall, Metallurgical Engineer	Wickwire Spencer Steel Company, Worcester, Mass.

WEDNESDAY, OCTOBER 20

Morning Session —10:00 A. M.

Carl E. Johnson, President, The Wire Association, Chairman

THE MORDICA MEMORIAL LECTURE

To Be Presented By
Flint C. Elder,
Special Research Engineer,
American Steel & Wire Co.,
Cleveland, Ohio

TITLE: "THE WIRE DRAWING DIE"

WEDNESDAY, OCTOBER 20
1:00 P. M.

WIRE ASSOCIATION ANNUAL LUNCHEON — HOTEL LaSALLE

— GUEST SPEAKER —
Captain A. J. Wellings,
Chief of Navy Material Inspection
Navy Dept., Washington, D. C.

(Members are at liberty to bring guests to hear this interesting speaker. Ladies are welcome and members and guests of other societies participating in the National Metal Congress are also invited to attend.)

WEDNESDAY, OCTOBER 20
4:00 P. M.

Wire Association Annual Meeting
Carl E. Johnson,
President, The Wire Association
CHAIRMAN OF MEETING

HOTEL LaSALLE

WEDNESDAY, OCTOBER 20
Evening — 7:30 P. M.

ANNUAL DINNER — STAG SMOKER — HOTEL LaSALLE

A. R. ZAPP,
Manager, Firthaloy Division,
Firth-Sterling Steel Company
McKeesport, Pa.
CHAIRMAN OF COMMITTEE

THURSDAY, OCTOBER 21
Morning Session — 9:45 A. M.

C. A. Litzler
Chief Engineer
Chairman of Meeting

Industrial Oven Engineering Co.
Cleveland, Ohio

PAPER: "Drawing of Fibres"

Sydney Coppick

PAPER: "Properties and Uses of Vinyl Resins for Wire & Cable"

G. A. Fowles
Plastic Materials Division

B. F. Goodrich Company
Akron, Ohio

THURSDAY, OCTOBER 21
Afternoon Session — 1:30 P. M.

Chairman of Meeting

PAPER: "Glass Insulations; Its Uses and Properties"

L. T. Russell

Owens-Corning Fibreglas Corp.
Toledo, Ohio

PAPER: "The Application of Synthetic Compounds to Wire by Extrusion"

H. K. Intemann

Halowax Products Div.
Union Carbide & Carbon Corp.
New York, N. Y.

Motion Picture

"Rubber in Industry"

B. F. Goodrich Company
Akron, Ohio

THURSDAY EVENING
OCTOBER 21 — 7:00 P. M.

AMERICAN SOCIETY FOR METALS DINNER
(Tickets for this dinner may be obtained at The Wire Association Registration Desk)

Complete Welding Rod Processing Plant Exhibited

"WELDING rods while you watch" was the order of the day at the Cleveland factory of the Moslo Machinery Company during an unusual ten-day demonstration of a complete welding rod processing plant, recently conducted. Several hundred representatives of rod making companies, welding engineers and members of foreign purchasing commissions followed the processing of rod through the Moslo plant, from wire reel to inspection table.

✦ ✦ ✦

THE plant demonstrated was one of several designed by Moslo and built for a foreign government, for whose representatives the builder had assembled the entire set-up in order to make a thoroughly practical inspection run. Viewing of the demonstration was by appointment only, and limited to those actually interested in welding rod making.

✦ ✦ ✦

WHILE the plant, quite naturally, was not assembled on permanent settings, it was arranged in a manner that effectively demonstrated the modern production-line layouts possible with the equipment shown. Starting with the weighing and mixing of flux on one side and the straightening and cutting of wire on another, the complete processing was shown step-by-step.

✦ ✦ ✦

A STANDARD flux formula was mixed, no attempt being made to go into the chemical details of the hundreds of different mixtures possible to use. Visitors saw the carefully weighed powder and the moistening agent thoroughly kneaded in the mixing machine, then the mud-like mix placed in a vertical slug press to be pressed, under 40 tons of pressure, into cylindrical slugs approximately twelve inches long, formed to fit the cylinder of a heavy duty horizontal extrusion press, the next machine in the production line.

✦ ✦ ✦

IN the extrusion press, 150 tons pressure was used to force the compacted flux into a heavy steel die-head. Directly connected to the die end of the extrusion press, the high-speed feeder forced the rods through the compressed flux in the die head, from whence they emerged through a die on the opposite side. The die exactly shaped the finished size of the coated rods. Not only must the exact outside diameter be maintained, but the rod must be precisely concentric within the coating. Interchangeable dies are made for all welding rod sizes.

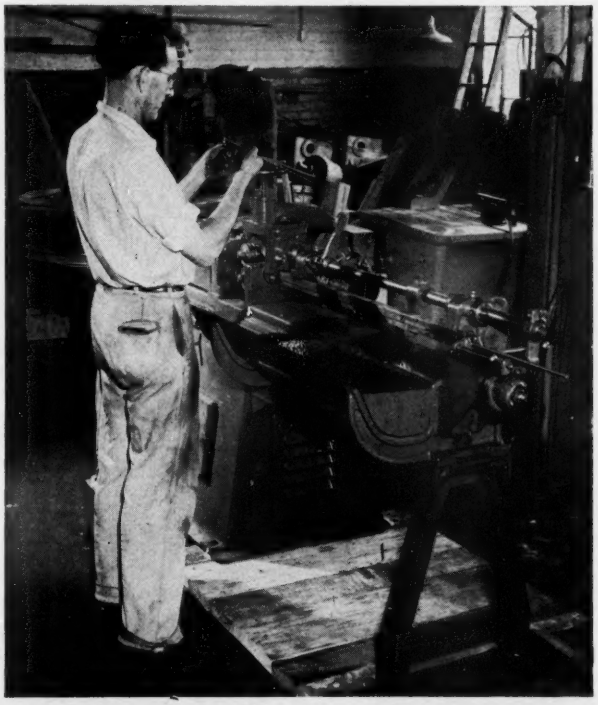

Fig. 1. Every step of welding rod processing, from cutting and straightening of rods from coils (above) was shown during the ten-day welding rod processing show at the Moslo Machinery Company's Cleveland factory.

✦ ✦ ✦

RODS came from the feeder at a surprisingly high speed, considering the exacting requirements. No speed rating was quoted, because of the wide variation of possibilities, depending upon the type of job going through, but this plant was operated at speeds up to 350 rods per minute. It was explained that this is not a particularly high speed plant, as 14 inch rods are often extruded as rapidly as 1000 per minute in larger installations.

✦ ✦ ✦

FROM the die head, a rapid-transverse conveyor, with a grooved belt of heavy rubber, whisked the freshly coated rods across to the brushing machine, where they dropped on another heavy rubber conveyor belt to be lined up and carried past a series of wire brushes. The rods emerged with flux removed from one end to make a bright clean contact about an inch long and with the other end brushed just enough to expose the clean, flat end of the rod.

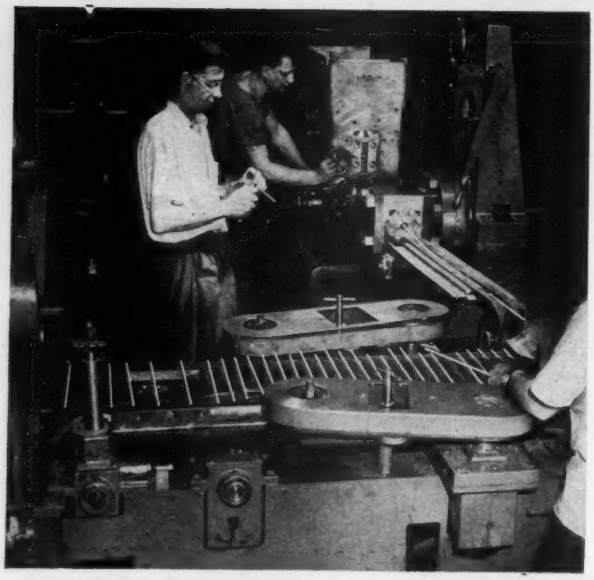

Fig. 2. Welding rod flux, compressed into a slug under 40 tons pressure, here is being loaded into the cylinder of the extrusion press, which will force it, at something around 150 tons pressure, into an extrusion die. Rods passing through the die at high speed, come out accurately coated.

Fig. 3. This corner of the Moslo welding rod processing plant is "the works". The feeder (rear of picture) shoots rods through the extrusion die (center) which does the critical job of flux-coating the rods to exact size and concentricity. In the foreground is the loading and aligning end of the brushing machine. Supervision (center) is about to check a coated rod for exact centering in the flux.

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RODS then passed from the brushing machine belt directly onto the receiving end of the long chain-belt conveyor which makes several passes at varied speeds through the oven. The rods were baked at temperatures ranging, in the various oven zones, from 250 to 400. Here a carefully balanced combination of rapidly circulated hot air and humidity sets the flux at ideal hardness.

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AT the finish end of the oven, a pick-up conveyor took the completed rods from the oven and delivered them for final inspection, weighing and packaging. During the demonstration many experts took samples from the completed run and tried their hands at testing rods on a welding table which the builder had thoughtfully set up in a corner of the factory.

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COMPLETE runs were made every day during the show, and attendance reached a point where it was necessary to put on runs both morning and afternoon. Many of those who came from actual rod producing plants expressed considerable interest in one factor which others had not thought of. That was the success in producing good quality rods achieved by the group operating the demonstration who, being essentially machine builders, had no special training in actual production operation. This seemed to speak well for the simplicity of modern welding rod plant design.

ERNEST P. MOSLO, president of Moslo Machinery Company, expressed keen satisfaction with results of the show.

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"WE are pleased for several reasons," Mr. Moslo said. "First, we have the satisfaction of seeing this completed plant for export use, work efficiently without a long shake-down run. Further, we found the demonstration well worth our extra trouble, from the standpoint of the practical interest shown by the people who are going to be producers of much-needed quantities of welding rods to meet the tremendous growth of the welding industry throughout the world."

IMPORTANT NOTICE

TO OUR

Advertisers – Members – Subscribers!

In compliance with the new Postal regulations, please supply us with your district ZONE NUMBER, if you have not already done so, in order that we may include it in our mailing address for you. Thank you.

Circulation Department, Wire and Wire Products

300 Main Street Stamford, Connecticut

✦ GOVERNMENT WIRE PRODUCTION INFORMATION ✦

Restriction On Use of Strapping

THE fulfillment of requirements for the defense of the United States has created a shortage in the supply of strapping for defense, for private account and for export; and the following order is deemed necessary and appropriate in the public interest and to promote the national defense:

✦ ✦ ✦

NO person shall use commercially any strapping on shipping containers unless:

(1) The weight of the container and contents exceeds ninety pounds, or

(2) The net weight of the contents of the container exceeds .058 pounds per cubic inch, or

(3) Use of the strapping is required by regulation or order of the Interstate Commerce Commission, or

(4) The container for which the strapping is used, and its contents, are to be delivered to or for the account of the Army, Navy, Maritime Commission, or War Shipping Administration, and the strapping is required by such agency, or

(5) The shipment is for delivery outside of both the United States and Canada, or

(6) The strapping is for any of the following containers, provided the strapping is essential to the safe delivery of the contents and has been customarily used for the same type of shipment and container:

(i) Wooden or fibre containers containing fruits, vegetables, meats, fish, or poultry.

(ii) Wooden containers containing plumbing supplies or fixtures, made of vitreous china.

(7) The strapping is for wooden lard or butter tubs, and wooden buckets or pails, or

(8) Use of strapping by railroad companies or truckers is required by them to reinforce containers damaged in transit, or

(9) The strapping is for closing fibre drums or hexagonal or octagonal fibre containers.

✦ ✦ ✦

Order P-136 Revised

USE of preference ratings by scrap metal processors for maintenance, repairs, and operating supplies is now controlled by Order P-136 as revised recently instead of CMP Regulation No. 5, it was announced by the War Production Board.

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SCRAP metal processors are persons operating scrap yards or automobile graveyards in the United States and Canada.

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PROVISIONS of the revised P-136 are as follows:

1. Processors of metal scrap must obtain a certificate and serial number before they are eligible to use the AA-2 priority rating for the purchase of maintenance, repair and operating supplies.

2. Minor capital additions obtainable under the order are restricted to $250 rather than to $500, as in CMP Reg. 5.

3. A slightly different certificate is to be used in lieu of the endorsements

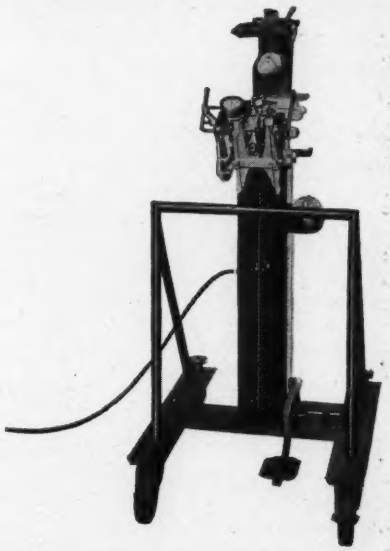
(*Please turn to Page 522*)

MICROMETER PRECISION MICRO-WELD TRADE MARK REG. U. S. PAT. OFF.

CONTINUOUS IMPROVEMENT

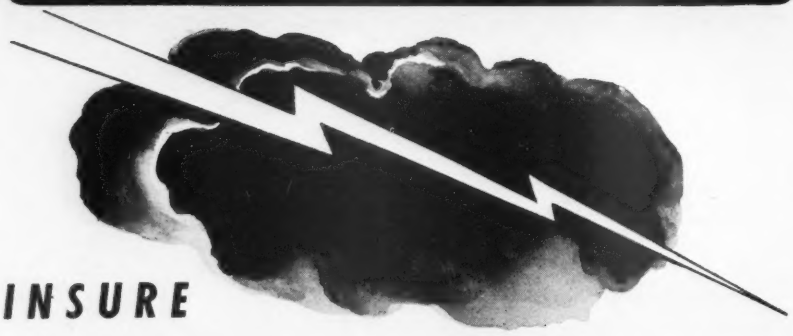
MICRO-WELDERS with dial indicating annealing attachments are now available for high carbon wire.

There is positive control of annealing temperature and already hundreds of these special MICRO-WELDERS are proving their dependability and satisfactory performance with leading manufacturers.



MICRO PRODUCTS COMPANY
20 NORTH WACKER DRIVE, CHICAGO, ILL.
Telephone, State 7468

STANDARD
DRAWING LUBRICANTS



INSURE

GREASED LIGHTNING

SPEED!

Speed and increased production is essential to supply the fighting front. Equally important is the quality of the product manufactured to serve the needs of our fighting men.

Standard's wire drawing compounds are manufactured to facilitate greater speed in wire drawing and maintain the physical characteristic of all grades of steel, copper, or brass. Standard compounds will produce the finish you require, lime bright, extra bright, sull coated or special finishes for welding, lacquering, enameling, or plating.

Listed below are a few of our Standard Lubricants; others are listed in previous issues.

#94

For drawing zinc-coated wire dry. Also used for dry ripper hole on wet wire drawing of zinc-coated wire. Order extra fine grind. This compound puts a metallic coating on the wire.

#48

A lower melting point soap for the drawing of high carbon rod or wire. Use this material in extra fine grind.

#1

For low carbon wire, on either machines or benches. Also the drawing of processed wire, and producing common finishes. For the drawing of rods use medium grind, and for processed wire, use fine grind.

#40

For drawing low or intermediate carbon wire. For low carbon wire use medium grind, and for intermediate carbons use fine grind.

STANDARD INDUSTRIAL COMPOUNDS COMPANY

4600 FERDINAND STREET SIC CHICAGO • ILLINOIS

Government Wire Production Information

(*Continued from Page 521*)

specified in CMP Reg. 5, or 7. A copy of that certificate is incorporated in the revised order.

4. The quantity restriction of CMP Reg. 5, limiting purchases in 1943 to 100 per cent of similar purchases of 1942, has been changed in the revised order to 120 per cent of 1942.

5. Under CMP Reg. 5 those processors whose aggregate requirements for maintenance, repair and operating supplies do not exceed $5,000 per year are exempt from the quantity restrictions. Under the Revision of P-136, the $5,000 amount has been reduced to $500 in the case of scrap metal processors.

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Steel for Testing

PROVISIONS of CMP Regulation No. 1 with respect to delivery of sample orders of steel for testing purposes have been modified to permit purchasers to receive up to 1000 pounds of any one composition or a total of 3000 pounds of all compositions. This applies to all types of steel except stainless, tool steel, and steel castings.

✦ ✦ ✦

SAMPLE order delivery requirements for testing purposes on all other controlled materials, including stainless steel, tool steel, and steel castings, continue to be limited to one per cent of the minimum mill quantity which is prescribed with respect to the various types of controlled materials in Schedule IV of CMP Regulation No. 1.

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THIS ruling is contained in Amendment No. 2 to CMP Regulation No. 1.

✦ ✦ ✦

Small Diamond Die Production Problems Being Solved

QUANTITY production of radio equipment for the armed forces was only possible after American mass production methods were applied to the diamond die industry, stated **Charles E. Wilson,** Executive Vice-Chairman of the War Production Board.

✦ ✦ ✦

INDISPENSIBLE in the radio equipment program is a coil of wire so fine that it is invisible to

the eye. One pound of it will span a hundred miles.

✦ ✦ ✦

THIS wire must be drawn through precisely drilled diamond dies. Prior to the war, there was no diamond die industry in this country making the smaller dies needed for this purpose. Our small requirements were filled in France and the Low Countries, where die craftsmen had been trained for generations.

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WE had to have craftsmen who could fashion the diamond dies. After a thorough search a half a dozen were found and persuaded them to go to work at their old calling. There was a shortage of tools, but with government aid, four small workshops were set up in an effort to build this vitally needed industry.

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AS a result of experiments conducted first in Britain and then in this country, there has been perfected a machine which can drill from eight to 12 dies at one time, instead of making them singly, by hand, as was the Old World custom."

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WPB also set up an experimental laboratory at the Bureau of Standards to improve processes and make dies with a longer operating life. These scientists are on the road to some significant discoveries.

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THE more wire we can draw through each individual die, the fewer dies we need. While this work is still going on, we have found ways to greatly lengthen the life of the die, which was normally limited to the drawing of one pound of wire.

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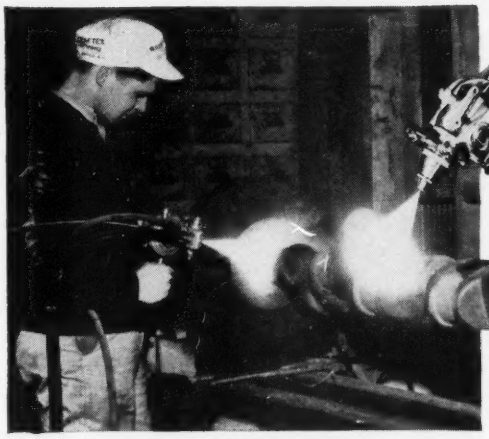
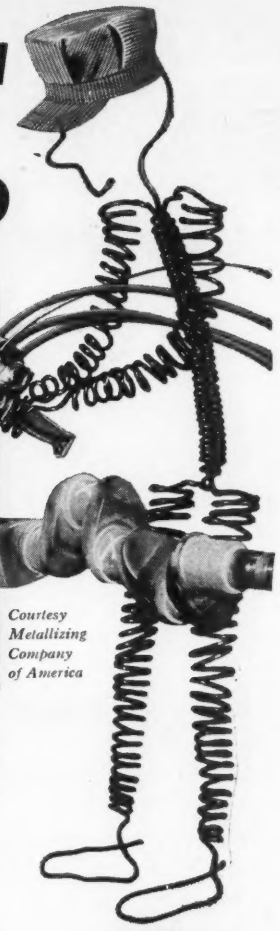
MR. WILSON pointed out that the die which drew as many as 25 pounds or 2,500 miles of wire is preserved as a museum piece but added, "we're getting more of those museum pieces."

(*Please turn to Page 524*)

Critically Needed Machinery SALVAGED



Courtesy Metallizing Company of America

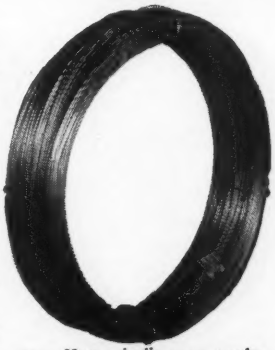


. . . with the help of KEYSTONE Wire

Under the pressure of rapid fire, three-shift production, machinery is wearing away many times faster than normal. Thousands of essential moving parts go out of service daily.

Metallizing, however, has become the magic word for revitalizing "laid up" machinery, restoring service quickly, saving countless tons of metal, hours of machining and assembly — and avoiding overburdened replacement costs as well.

In this service of salvage, Keystone wire is performing a basic wartime function — another important reason why Keystone production for civilian uses must be restricted until Victory is assured.



Above—Here a badly worn crankshaft is built up with the metallizing gun for machining back to original dimensions. Wire enters the back of the gun and is sprayed through the nozzle in molten form onto the worn surfaces. One of thousands of wartime uses for wire mill production.

The most critical raw material is still SCRAP. Get every pound to the steel mills.

KEYSTONE STEEL & WIRE CO.

Special Analysis Wire for All Industrial Uses

SAMSON SPRING WIRE

KEYSTONE STEEL & WIRE CO. PEORIA ILL.

PEORIA ILLINOIS

Wire Association Organizing Pacific Coast Chapter

AS a result of suggestions made by Wire Association members in California, it has been decided to proceed with the organization of a Pacific Coast Chapter which will have its own organization and Chapter officers and hold meetings semi-annually; one meeting to be held at San Francisco in the Fall and one meeting to be held at Los Angeles in the Spring of each year.

✦ ✦ ✦

THE initial organization meeting will be held at San Francisco, on Friday, October 29th, 1943 and tentative plans include interesting papers, a luncheon and a plant inspection.

✦ ✦ ✦

IT will be noted that this date, October 29th, does not agree with the notice sent out which stated that the meeting would be held early in November. The change of date is due to the fact that the Association's Executive Secretary, Major Richard E. Brown, and his assistant, Mrs. R. S. Spengel, will terminate their activities at the National Convention in Chicago on October 23rd and by going direct to San Francisco from Chicago can more conveniently be present at this Pacific Coast Chapter Organization Meeting. After consultation with Pacific Coast members it was decided that the change would be acceptable. Hence the date will be as noted, Friday, October 29th, 1943.

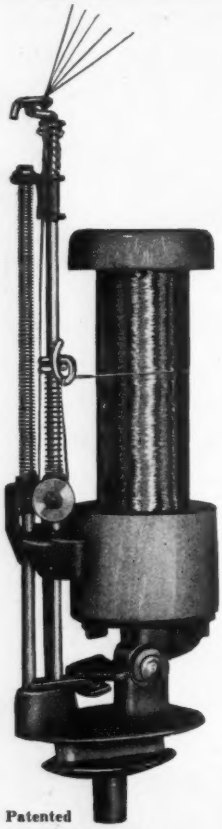
✦ ✦ ✦

AT this meeting the Chapter will be organized, officers selected and local committees appointed to be in charge of the local regional meetings to follow. The Executive Secretary of the Wire Association, Major Richard E. Brown and his assistant, Mrs. R. S. Spengel, both from WIRE & WIRE PRODUCTS, Stamford, Conn., will be present to assist in the organization work and to outline the policies and benefits of the Wire Association.

✦ ✦ ✦

MEMBERSHIP in the Wire Association includes the following:

1. **Question and Answer Service. Answers to technical and operating problems direct by mail. Available to members only.**
2. **Annual Convention and Exhibition. (In association with American Society for Metals and The National Metal Congress.) Technical Sessions, Plant Inspections.**
3. **Regional Meetings. Attendance at the regional meetings which include Local Plant Inspections. Technical Sessions and Discussions.**
4. **Personal Contacts. Both at Annual and Regional Meetings, and throughout the year, for interchange of helpful information.**
5. **Information Service on Machinery, Equipment and Supplies. The Tech-**



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MOSSPEED Carrier.

MOSSPEED BRAIDER CARRIERS
FOR BRAIDING
MULTIPLE ENDS OF FINE WIRES

A special design MOSSPEED CARRIER and BOBBIN is supplied for braiding "SHIELDED" WIRE & ETC.

Will braid multiple ends of fine aluminum, brass, bronze or copper wire, Etc.

SHEAVE-WHEEL on braider-stop and SPECIAL-THREADEYES on carrier, together with new type BOBBIN provides an even wire "let-off" resulting in a high quality and uniform braided shield.

Consult our engineers regarding your braiding problems.

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nical, Catalog and Correspondence Files of the Wire Association hold the answer to practically every "Where can I buy" problem. This service is available to members without charge.

6. **Wire & Wire Products—For one Year. The official publication of The Wire Association, covering the Wire Industry, its Metallurgy, Technology, Research, Processes, Machinery and Personnel.**
7. **The Annual Buyers Guide & Year Book of the Wire Association. The Year Book Section contains: Constitution and By-Laws of The Wire Association; Details of year's Meetings, etc.; List of Members, Index to Papers and Articles in WIRE & WIRE PRODUCTS.**

✦ ✦ ✦

INVITATIONS to join in this activity are being mailed to a limited list at the present time. However, anyone interested is invited to write for information to any member of the Organization Committee and full information will be quickly given.

✦ ✦ ✦

THE Organization Committee of the Pacific Coast Chapter of the Wire Association is as follows:

Earl R. Potter, Supt., Standard Wire Division, California Wire Cloth Corp., South San Francisco, Calif., CHAIRMAN.

K. H. Davis, President, K. H. Davis Wire & Cable Co., Los Angeles, California.

Emerson Spear, Vice President, Pacific Wire Rope Co., Los Angeles, California.

Ray D. Mack, Pacific District Mgr., Carboloy Co., Inc., Los Angeles, California.

Harry T. Hartwick, Service Engineer, Firth-Sterling Steel Co., Los Angeles, California.

T. H. McSheehy, Sales Representative, Wickwire Spencer Steel Co., San Francisco, California.

Richard E. Brown, Executive Secretary, The Wire Association, Stamford, Connecticut.

✦ ✦ ✦

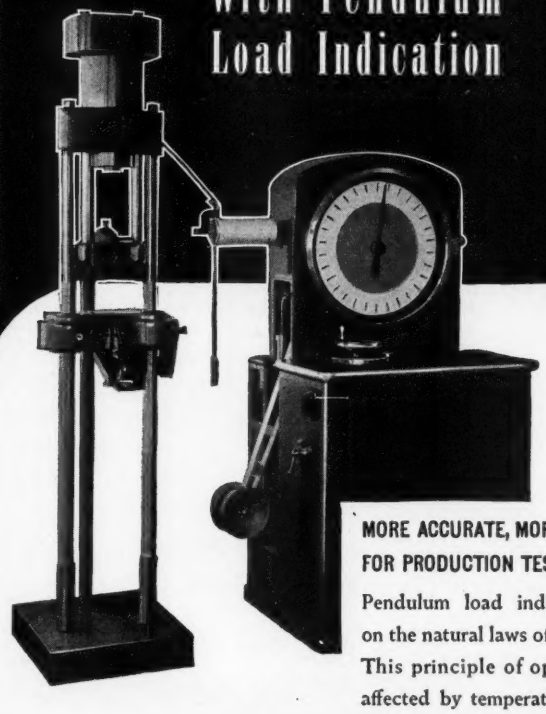
"Light Bench Type Electric Spot Welders Ranging From 1/4 to 3-KVA"

THE Eisler Engineering Co., Newark, New Jersey for the past 24 years designing and building all forms of automatic resistance welding machines in sizes from ¼-KVA up to 300-KVA, has just issued a profusely illustrated 28 page special Bulletin No. 93-W-43 describing the specific line of the popular small spot welding machines manufactured by the company.

✦ ✦ ✦

OPERATING principles, typical standardized arrangements and special applications of these practical machines, particularly suitable for continuous production in assembly work and widely used in the manufacture of radio tubes, incandescent lamps, optical, jewelry, novelties, sheet metal and wire work, are explained and shown in a variety of types built in the rocker arm or in the plunger press style with single or production increasing double and three electrode model and in the new devised vertical foot operated "Precision" Spot Welder Units. The catalog contains also a multitude of special welding tips and fixtures, illustrations of automatic Welding Timers and Contactors and numerous types of Transformers manufactured by the company. Copy of Bulletin free upon request.

PRECISION
HYDRAULIC TESTING MACHINE
with Pendulum
Load Indication



MORE ACCURATE, MORE DEPENDABLE FOR PRODUCTION TESTING BECAUSE:

Pendulum load indicator operates on the natural laws of gravitation.... This principle of operation is not affected by temperature changes or subject to metal fatigue. . . . *Write for descriptive literature and quotations.*

ARMY E NAVY

RIEHLE
TESTING MACHINES
Division of
American Machine and Metals, Inc., East Moline, Illinois

Other Products: IMPACT TESTERS · VICKERS HARDNESS MACHINES
BRINNELL HARDNESS TESTERS · MEASURING INSTRUMENTS

Outstanding Personalities of the Wire Industry

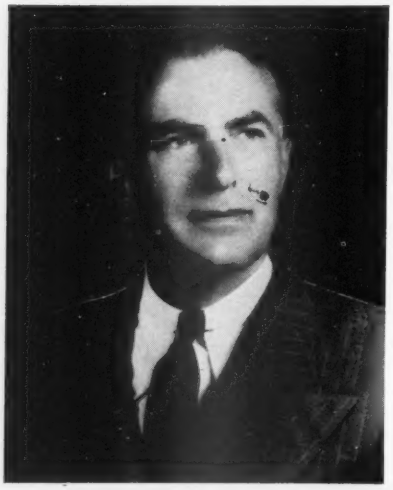
K. R. Beardslee, Vice-President in Charge of Sales, Carboloy Company, Inc.

K. R. BEARDSLEE, for the past seven years General Sales Manager for Carboloy Company, Detroit, has been named Vice-President in Charge of Sales according to an announcement by **W. G. Robbins,** President, Carboloy Company, Inc., Detroit.

✦ ✦ ✦

MR. BEARDSLEE, who has been associated with the Carboloy Company for the past thirteen years, first in the Newark branch office and later as district manager in the Pittsburgh office, will thus be in direct charge of the sale of all Carboloy products, including dies, tools, tool grinders, wheel dressers, the recently announced electronic brazing equipment, etc.

MR. BEARDSLEE is a member of both the Wire Association and the American Society of Tool Engineers, Director of the Detroit Sales Managers Club and President of the Lochmoor Club.



K. R. BEARDSLEE,
Vice President, Charge of Sales,
Carboloy Company, Inc.

✦ ✦ ✦

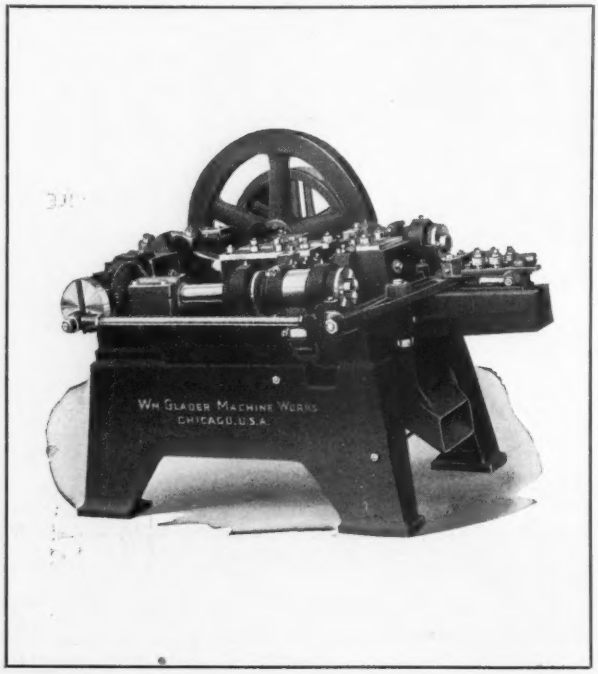
W. H. Cordes Appointed Head of Sales Research and Development Division, American Steel & Wire Co.

CREATION of a Sales Research and Development Division headed by **W. H. Cordes,** advertising manager of the company, has been announced by American Steel & Wire Co., subsidiary of U. S. Steel Corp.

✦ ✦ ✦

THE new division will carry on the study of post-war markets for existing products of the company, study and investigate the effect of the use of substitute materials and new application of old ones, and will explore new ideas for new products and possible new uses for normal products. Also to be considered is the possible need

GLADER HIGH SPEED WIRE NAIL MACHINE



High tonnage output, and low maintenance costs, have resulted in Glader Machines being accepted as standard equipment in every large nail mill built in the United States in the past twenty years.

Glader Machines are operating in most of the wire producing mills throughout the world.

These machines are made in eleven different types and sizes. This enables us to cover the range of sizes of nails produced with the greatest efficiency.

For further information please address,

WM. GLADER MACHINE WORKS

210 NO. RACINE AVE.
CHICAGO, ILLINOIS

for altered distribution and merchandising methods in the faces of changes in existing practices.

✦ ✦ ✦

MR. CORDES has been with American Steel & Wire for thirty years, most of which has been in the advertising department. He has been manager of sales promotion and advertising since 1935.

✦ ✦ ✦

L. K. Behr, Philadelphia Dist. Mgr., Norton Company

LEROY K. BEHR has been appointed District Manager in Philadelphia for the Abrasive Division by Norton Company, Worcester, Massachusetts, succeeding the late **Allan Seymour.** Mr. Behr has been with Norton Company for sixteen years, first in the Sales Engineering Department at Worcester and then as Abrasive Engineer in England. For the last three years he has been Abrasive Engineer for eastern Massachusetts, and Maine with headquarters in Boston. The district under the supervision of the Norton Philadelphia branch includes southeastern New York, New Jersey, eastern Pennsylvania, Delaware, eastern sections of Maryland and West Virginia, Virginia, North Carolina, South Carolina, and eastern Tennessee.

✦ ✦ ✦

JOHN C. EWER who has been Abrasive Engineer for Norton Company for western Massachusetts, Rhode Island Vermont and New Hampshire takes over Mr. Behr's former territory and is in turn succeeded by **C. Barnard Price, Jr.** who has been Field Engineer for New England.

✦ ✦ ✦

E. A. Renfer, Mgr. Marion Plant, Anaconda Wire & Cable Co.

E. A. RENFER, manager of the Sycamore (Ill.) plant, Anaconda Wire & Cable Co., has been appointed manager of the Marion, Ind., plant also, succeeding **Frank E. Hart,** who has been transferred to the Chicago sales office.

Clarence H. Linder, Assistant Manager, Schenectady Works, General Electric Co.

CLARENCE H. LINDER has been named assistant manager of the Schenectady works of the General Electric Co., it was announced recently by **J. M. Howell,** general manager, who at the same time announced the appointment of **Frank T. Lewis** of Lynn, Mass., as assistant to the works manager at Schenectady.

Rosse Handles Export Sales for Wickwire Spencer Steel Company

THE Wickwire Spencer Steel Company announces the appointment of **Matthew R. Rosse** as Sales Manager, Export Division, succeeding **W. H. Lynn.**

✦ ✦ ✦

MR. ROSSE, a native of Glasgow, Scotland, was raised and educated in the United States.

(*Please turn to Page 534*)

Can You afford TO PASS UP THIS 50% Saving IN TIME AND FUEL?

Patented and Patents Pending

Carl-Mayer Hi-Speed Rod Baker is the fastest rod baker built — no other rod baker even approaches its speed and economy. Blow-Off Feature removes moisture without bumping or agitating the coils.

But you don't need to take our word for it! Let us tell you where you may see this remarkable rod baker in operation and consult with enthusiastic users. Past performance is a guarantee of results to come.

CARL-MAYER HI-SPEED TRADE MARK ROD BAKER

The Carl-Mayer Corp.
3030 Euclid Ave., Cleveland, O.

●

ROD BAKERS, WELDING ROD OVENS, INDUSTRIAL FURNACES

A FEW CARL-MAYER CUSTOMERS:

Allegheny Ludlum Steel Co.
Aluminum Co. of America
Atlantic Wire Co.
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American Magnesium Corp.
Bridgeport Brass Co.
Eclipse Aviation Division of Bendix Aviation Corp.
Ford Motor Co.
General Motors Corp.
Hollup Corporation
Hyatt Roller Bearing Co.
Johnson & Nephew, Ltd.
Page Steel & Wire Co.
Pittsburgh Tool Steel Wire Co.
Reliance Manufacturing Co.
Steel Co. of Canada
Timken Roller Bearing Co.
Thompson Products Co.
Weatherhead Co.
Wickwire Spencer Steel Co.

A Review of Recent Wire Patents

No. 2,323,333, INSULATING ENAMEL FOR ELECTRIC CONDUCTORS, patented July 6, 1943 by Henry J. Kauth, Rome, N. Y., assignor to General Cable Corporation, New York, N. Y., a corporation of New Jersey.

A coating for the wire is produced by the combination of a drying-oil modified alkyd resin, with a resin produced by the partial condensation of furfuryl alcohol.

✦ ✦ ✦

No. 2,323,890, COATED WIRE, patented July 13, 1943 by Orville E. Adler, Niles, Mich., assignor to National-Standard Company, a corporation of Michigan.

The iron wire is coated with a corrosion-resistant metal of the class consisting of zinc, cadmium, lead and tin, the coating being between 0.00004 and 0.0001 inch thick, over which is a thin copper coating, and the coated wire being drawn through a die so as to reduce its cross sectional area.

✦ ✦ ✦

No. 2,324,258, SPRING MATTRESS STRUCTURE, patented July 13, 1943 by Fred Hampton, Bellerose, N. Y., assignor to Zimets Bed Spring Corporation, Brooklyn, N. Y.

The invention is devoted mainly to the connection of the outer rows of coil springs to the frame, with a special arrangement of small coiled wires radially connected with the corner springs.

Complete Descriptions and Drawings of Patents May Be Had for 25 cents. Address, Wire & Wire Products, 300 Main St., Stamford, Conn.

✦ ✦ ✦

No. 2,324,651, REINFORCING BAR, patented July 20, 1943 by Joseph D. Stites, New York, N. Y.

A twisted and stretched bar for concrete work is provided, comprising a number of outer sections of substantially equal cross-sectional area, a center core of less cross-sectional area than any individual outer section, and relatively narrow webs integrally connecting the core with the outer sections, the cross-sectional area of this inner core being such that when the bar is twisted about the axis of the core, the unit compressive stresses on the core are substantially equal to the total unit tensile stresses on the outer sections.

✦ ✦ ✦

No. 2,324,855, COIL HANDLING SYSTEM AND METHOD, patented July 20, 1943 by Norman B. Lane, Englewood, William S. Mingle, Leonia, and Herman H. Colson, Teaneck, N. J., assignors to Aluminum Company of America, Pittsburgh, Pa., a corporation of Pennsylvania.

This is a pre-rolling coil-handling method for strip metal. There are 18 claims.

✦ ✦ ✦

Reissue 22,356-7, ALLOY, patented July 27, 1943 by James M. Lohr, Morristown, N. J., assignor to Driver-Harris Company, Harrison, N. J., a corporation of New Jersey.

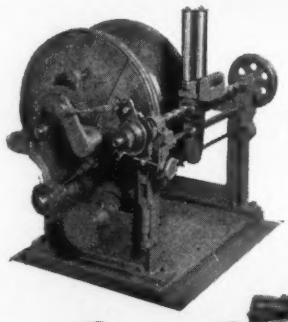
These two patents cover electric resistance elements, one comprising 15 to 25 percent chromium, .01 to .20 percent calcium, .01 to .50 percent zirconium, .01 to 1 percent aluminum, balance nickel, and the other comprising 10 to 15 percent chromium, 25 to 30 percent iron, .01 to .20 percent calcium, .01 to .50 percent zirconium, .01 to 1.0 percent aluminum, balance nickel.

✦ ✦ ✦

No. 2,325,044, MANGANESE ALLOYS, patented July 27, 1943 by Reginald S. Dean, Salt Lake City, Utah, assignor to Chicago Development Company, Chicago, Ill., a corporation of Illinois.

In order to produce hardened stainless alloys of iron, chromium and manganese, the inventor selects an alloy within the composition range 16 to 30% manganese, 17.5 to 30% chromium and balance iron, then heats the alloy to about 1200° C.

ROBINSON TUBE-TYPE WIRE STRANDERS



IMPROVED REEL STAND

IMPROVED FRAME & TUBE

IMPROVED GEAR BOX

IMPROVED DRIVE

COMPLETELY REDESIGNED!

Sage engineering . . . Sound construction . . . and the knowledge gained through the exchange of ideas with customers . . . All are embodied in the advanced design and superior operation of the new improved Robinson Wire Strander. Full information available upon inquiry!

ROBINSON MANUFACTURING COMPANY
WORKS — MUNCY, PENNA.

Sales Representatives

MERCER-ROBINSON CO., INC., 30 CHURCH ST., NEW YORK

UNIQUE

No. 2,325,121, COIL HANDLING APPARATUS, patented July 27, 1943 by Malcolm H. Freeman, Maryville, Tenn., assignor to Aluminum Company of America, Pittsburgh, Pa., a corporation of Pennsylvania.

The coil is moved in an arcuate path from the receiving station to the discharge station. There are 22 claims.

✦ ✦ ✦

No. 2,325,126, METHOD OF COATING STRIPS, patented July 27, 1943 by Jean V. Giesler, Knoxville, Tenn., assignor, by mesne assignments, to Reynolds Metals Company, New York, N. Y., a corporation of Delaware.

Thick coatings of metal are produced on strips of base metal, by moving the strip through the bath and out of the molten metal at a large angle on the order of a right angle to the surface of the bath and maintaining the strip within the molten metal at and adjacent to the surface under a substantial vibration at an angle to the face of the moving strip so that the surface of the molten metal, where the strip is withdrawn therefrom, is kept under agitation.

✦ ✦ ✦

No. 2,325,156, METHOD OF COATING WIRE, patented July 27, 1943 by Marshall G. Whitfield, Louisville, Ky., assignor to Reynolds Metals Company, New York, N. Y., a corporation of Delaware.

In this variation, the wire is continuously moved at a high speed in the same direction through a closed orbital path traced at the surface of the bath, thus establishing an uninterrupted wave.

✦ ✦ ✦

No. 2,325,342, WIRE DRAWING APPARATUS, patented July 27, 1943 by Russell W. Pursel, Indianapolis, Ind.

Apparatus is provided for heat treatment of wire, for carrying out annealing, bright, blue or color annealing, and for relieving the stress of the metal, sometimes called "spheroidizing."

✦ ✦ ✦

No. 2,325,462, COIL-FORMING APPARATUS, patented July 27, 1943 by Oscar F. Arthur, Belle Vernon, Pa.

For coiling wire into helical form, this apparatus is adapted to vary the pitch or angle of the helical turns.

✦ ✦ ✦

No. 2,325,549, IGNITION CABLE, patented July 27, 1943 by John P. Ryzowitz, Wallington, N. J., assignor to The Okonite Company, Passaic, N. J., a corporation of New Jersey.

About a continuous glass cord is wrapped the copper conductor wire. The glass cord has a tensile strength equivalent to that of steel.

✦ ✦ ✦

New Floor Cleaner

A NEW oil and grease absorbent and floor cleaner, to be marketed under the name "Absorbo," has been developed by the Fidelity Chemical Products Corporation, manufacturers of specialized cleaning compounds and detergents, of Newark, New Jersey. The product is listed by the Underwriters' Laboratories, Inc., as a Class 1 noncombustible absorbent "for reducing fire and slipping hazards and for cleaning floors."

✦ ✦ ✦

THOUGH granular in form, Absorbo is non-abrasive and will not damage machinery or working parts due to abrasive action. It is also odorless, non-poisonous, and non-injurious to skin, clothing, or flooring, according to the manufacturer. It may readily be spread by hand and used on any type of floor surface. It absorbs up to 45% to 50% of oil or grease by weight.

✦ ✦ ✦

THE product is being introduced in 50-pound bags. Samples, descriptive literature and copies of the Underwriters' Laboratories report are available on request to the manufacturer.

WIRE and CABLE
Processing
EQUIPMENT

COMPLETE LACQUERING SYSTEMS
•
DRYING ROOMS
•
LACQUER POTS
•
STOP WIRE SHUTOFFS
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SPECIAL PROCESSING OVENS FOR WIRE AND CABLE

REEL STANDS UNWIND
•
REEL STANDS WINDUP

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Among other vital information in this book is a blueprint of a typical cable-oven installation, of interest to all wire and cable processing men. Send today for your free copy.

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The Importance of Limestone and Its Products in the Manufacture of Iron and Steel

(*Continued from Page 512*)

every last bit of nitrogen under the present unprecedented demands for nitrogen in explosives.

✦ ✦ ✦

COKEING coal comes from mines dusted with pulverized limestone in order to eliminate or minimize explosions and the silica brick used in coke oven construction as well as other important units incidental to the production of iron and steel are manufactured with the incorporation of small amounts of lime. Thus, lime indirectly, as well as directly, is an important factor in the successful manufacture of iron and steel.

✦ ✦ ✦

ALMOST invariably the water for boilers, tuyeres, etc., must be softened or treated to remove objectionable contaminations. Also much of the trade wastes containing waste acid and other contaminations are treated either with lime alone or in conjunction with other chemicals to minimize stream pollutions.

✦ ✦ ✦

FORTUNATELY, limestone is an abundant mineral fairly well distributed throughout our country. Consequently, the iron and steel industry whether it used limestone or lime products manufactured there from is favored with an abundant source of supply readily available.

✦ ✦ ✦

IN peace times, iron and steel constitutes the most important structural materials in existence. If it weren't for the abundant supply of limestone and lime, it would be impossible to supply the demands. It might be possible to substitute some other basic material such as soda ash at a greatly increased cost, but even at that, lime is necessary in the manufacture of soda ash, so that indirectly lime would still constitute a very important factor. Limestone not only possesses the desired chemical properties, but at the same time it has a high compressive strength, important in blast furnace operations.

✦ ✦ ✦

IN war times, such as we are now experiencing, when the tempo of iron and steel production is increased to almost the breaking point, the importance of limestone and lime becomes more than apparent. The job of supplying the metal industry with the proper quality and quantity of limestone products has become somewhat complicated. Nevertheless, the limestone industry has been able to keep pace with the increased tempo. This has been due in part to the fact that prior to the war, high quality limestones were highly competitive with each other, a condition which stimulated increased production units. Added to this increased new production was the ability to press into service some abandoned units

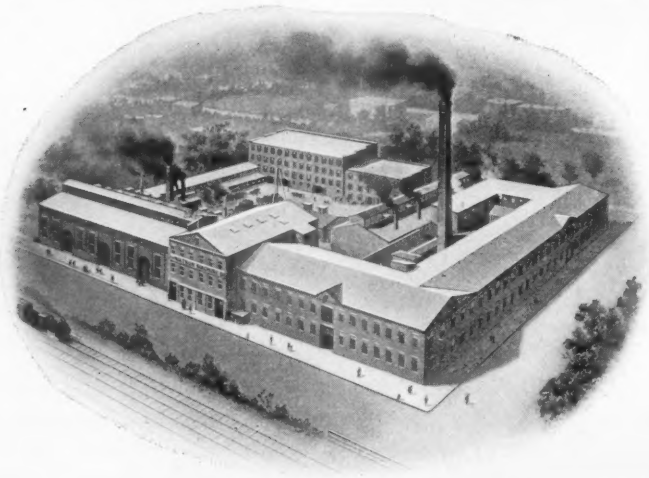
THE WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON, NEW JERSEY, U. S. A.

ELECTRICAL WIRE AND CABLE AND WIRE ROPE MACHINERY

Stranders
Bunchers
Cablers
Closers
Armor. Machines
Tapers
Juters
Serving Heads
Compound Tanks
Saturating Tanks
Powderers and Chalkers
Capstan Sections



Let-offs
Gang-Spoolers
Re-winders
Capstan Takeups
Continuous Takeups
Heavy-Duty Takeups
Traverses
Measuring Mach's.
Testing Mach's.
Vulcanizers
Polishers
Reel Crutches

MEAS. MACH'S., TRAVERSES, REEL CRUTCHES, BUNCHERS, SMALL POWDERERS, ETC. — USUALLY CARRIED IN STOCK

LITERATURE AVAILABLE ON ALL LISTED UNITS

which were not entirely too obsolete.

✦ ✦ ✦

AS to the maintenance of quality under the present unprecedented quantity demands, lime, and limestone are about in the same position as iron and steel. Prior to the war, specifications on almost every conceivable manufactured product were becoming more rigid from time to time. A condition developed where the requirements prescribed for many materials were considerably more than ample for ample quality. The fetish of unnecessary strength in some structural material was carried to extremes along other lines. This, of course, was a healthy condition, on the assumption that things can't be too good, so that when the extreme emergency descended upon us we were all in a position to sacrifice some of the excesses here and there without seriously impairing quality. The number of emergency specifications governing metal products is indicative of the liberalization in requirements experienced by other materials.

✦ ✦ ✦

THE importance of limestone in enabling the iron and steel industry to fulfill its enormous responsibility in the successful prosecution of the war is worthy of recognition.

✦ ✦ ✦

New Trade Association Formed

A NEW trade association in the metals field sprang into being just at the time an old-timer, the National Association of Flat Rolled Steel Manufacturers, went out of business.

✦ ✦ ✦

THE new association is the Pressed Metal Institute, 19 W. 44th St., New York, organized March 17 by some 60 representatives of sheet and strip metal fabricators, rolling mills and metal press manufacturers. It will cooperate closely with Government departments to increase mass production, and will develop new uses for metal stampings for post-war. Another office has been established in the Press Bldg., Washington. The new president of the institute is **George F. Whitlock**, president, Mullins Mfg Co., of Warren, Ohio.

✦ ✦ ✦

General Bulletin Covering War-Time Instruments and Services Published

THE Bristol Company of Waterbury, Conn., announces a bulletin containing general information on its line of industrial instruments for controlling and recording war-time processes.

THE bulletin, in folder form, is virtually a buyers guide of air and electric operated controllers, recorders, indicators, and telemetering recorders and controllers. Bulletins covering each type of product are listed for those interested in further details.

✦ ✦ ✦

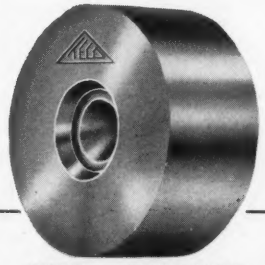
A COPY of this bulletin #DM006 may be had upon request.

with **TECO**
CARBIDE DIES

If you're wondering how to increase production with present facilities . . . don't overlook the important part played by Dies. A die can "bottleneck" or boost your production, depending upon its all-around efficiency on the job.

TECO Carbide Dies have demonstrated unusual capacity for high-speed, long-run production of smoothly-finished, on-size wire. TECO Carbide has greater resistance to wear — result of rigidly controlled density, hardness and uniformity.

Try a test run with TECO Carbide Dies on a few of your machines and let them prove themselves. Our engineers will be glad to assist you.



WIRE and BAR DIES
EXTRUDING DIES
TUBING DIES
SIZING DIES

•

Also Carbide Blanks, Tools, Bits, Reamers and Forming Tools.

TUNGSTEN ELECTRIC CORPORATION, 564 39th Street, Union City, N. J.

Branch Office: 2906 Euclid Avenue, Cleveland, Ohio
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TECO Pioneers in Tungsten Carbides for over a Quarter Century **CARBIDE DIES**

Steel Wire—Its Manufacture and Properties

(*Continued from Page 514*)

bridge constructed in 1929 where tempered wire was used. The Moehl and Co. installations for hardening and tempering steel wire and the electric furnace installation by Siemens Schuckert are illustrated. Mention is made of water quenching low carbon spring wire.

✦ ✦ ✦

ANOTHER finishing operation used for some wires is the straightening, cutting and sometimes polishing of wire. To do this machines have been built in Germany by Sempuco, Loose and Schumag, which are illustrated. The wire may be pulled thru wood to straighten. If a dead "cast" is desired, roll arrangements are necessary.

✦ ✦ ✦

FLAT wire is cold rolled round wire. Conditions for its manufacture entail knowledge of the influence of rolling on the broadening of the wire. Carbon content and microstructure have practically no effect.

✦ ✦ ✦

STEEL wire before leaving the mill is often coated. Zinc may be coated either by the hot dip process or by electrogalvanizing. In any case the process is made continuous. Mention is made of the Crapo and Schueler processes. In Germany, apparently, modifications of the Crapo process are used. For more details the reader is referred to "Stahl and Eisen" vol 58, (1938) p. 402-405.

✦ ✦ ✦

IRON zinc alloy layers, thickness of deposit, effect of hot dipping on the properties of the steel wire are considered. Hot dip installations and the take-up frame are illustrated. Testing of zinc coatings on steel wire entails determination of uniformity of coating (Preece test), thickness of coating and distinction between hot and cold galvanized coatings, and "bloom" on Zinc coatings. Hot dip tinning and electrotinning are mentioned briefly and several references given.

✦ ✦ ✦

TESTING of wire is the subject of the last chapter (XVII) and tensile testing, reverse bending, twisting, spring-back endurance, and impact testing are discussed and photographs of some equipment used in Germany are reproduced.

✦ ✦ ✦

THE author makes reference to 344 articles, pamphlets and books on the various subjects he deals with. The reference to German articles number at least 220, some 40 to American articles, and 25 to English periodical publications.

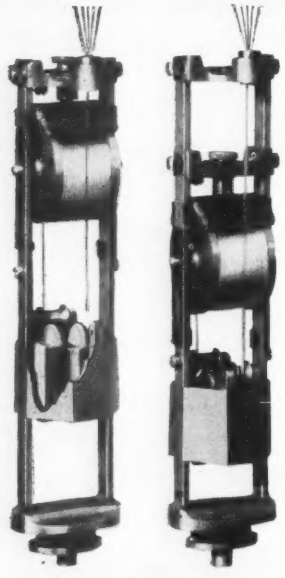
✦ ✦ ✦

THIS book should serve well as an introduction to the men coming from colleges and entering the wire industry. The theory

"TRITON" HIGH CAPACITY WIRE CARRIERS

For Precision Hard Wire Braiding, Hydraulic Flexible Tubing, Hose and Electric Cables

Fitted To All Sizes Except No. 1A.



Heavy Tension. Perfect Control. Can Be Fitted To Most Braiding Machines.

No. 1A "TRITON" CARRIERS.

Length of Wire Braid.

Send Us:-

Horngear Size, Depth and Profile of Track and Number of Gears or Carriers.

Patented In All Principal Countries

SEND FOR LEAFLET 10/4

Carrier	Horngear Dia.	Bobbin Size	Wt. of Wire	Tension
1A	4ins.	2¼ins. x 1¼ins.	1 lb.	1·25 lbs.
3A	6⅜ins.	3½ins. x 1¾ins.	3·25 lbs.	5·75 lbs.
4A	7½ins.	4½ins. x 2ins.	6 lbs.	7 lbs.
6LB	11 1/16ins.	6¼ins. x 3ins.	17·25 lbs.	11 lbs.

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MACHINERY FOR BRAIDING, TUBING, INSULATING CABLES, ETC.

and experimental work of a scientific nature discussed in the first third of the book might be of interest to the man who knows "how" but would like to know some of the "why" of wire drawing. The book covers the wire and its allied fields in a very general way from the practical view point and does not add to present American practice.

✦ ✦ ✦

BELOW are given the titles and publishers of the books dealing with wire drawing mentioned at the beginning of this review.

✦ ✦ ✦

1. British Wire Drawing and Wire Working Machinery; Dunnell, H. Constable and Co. Ltd. London 1925.
2. Wire Drawing and the Cold Working of Steel; Adam, A. T. 2nd Ed. H. F. and G. Witherby, London 1936.
3. Steel Wire, Manufacture and Properties; Bonzel, M. Translated from French by K. B. Lewis Engineer's Book Shop, New York, 1935.
4. Principes généraux de l' étirage et du tréfilage; Soliman, G. Gauthier-Villard and Cie., Paris 1924.
5. Essai sur le tréfilage; Papier, R. Edition de l'Usine," Paris 1925.
6. Technique de l'étirage; de Lattre, G. Edition de l'Usine, Paris 1927
7. Le tréfilage de l'acier; Bonzel, M., Dunod, Paris 1934.
8. Geschichte der Esinedrahtindustrie; Döhner, O. H. Julius Springer, Berlin, 1925.
9. Die Herstellung der Fluszeisen-und Stahldrähte; Altpeter, H. Martin Boerner, Halle a.d.S. 1926.
10. Drahtweltbuch; Boerner, M. 2nd Ed. Martin Boerner, Halle a.d.S. 1929.

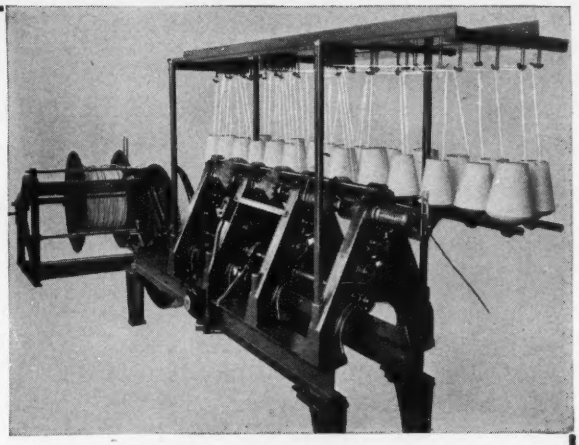
✦ ✦ ✦

Die Training Courses Listed in Carboloy Booklet

A 20 PAGE booklet #D-115 giving an outline of free training courses in carbide die servicing has been issued by Carboloy Company, Inc., Detroit. The courses are available to selected individuals in any mill using cemented carbide dies. Courses — which are actual shop training periods — are so arranged that training of any individual can be confined to the specific problems encountered on products produced in his own mill, thereby shortening the training time to only a few days.

FIDELITY
SINFRA
MULTIPLE-HEAD
HIGH-SPEED
COVERING
MACHINES

• • •

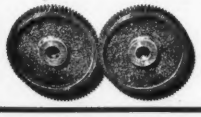


Knits two or three cotton coverings on bare wire up to #6 gauge—also flat or shaped, continuous-strip material, 1200 to 1500 feet per hour. Saves rubber since cotton coverings, impregnated, form excellent insulation. Straightening rollers operate horizontally and vertically. Each head knits one cover. 20″ or 36″ capstan take-off—separate haul-off reel stand, 40″ O.D., with traverse mechanism, 1000 lb. capacity.

Other advantages include: automatic electric stop motion on each yarn; improved knitting head and needle design; knits direct from large cones; quiet operation reduces operator fatigue.

Available in double- and triple-head types. Write for Bulletin.

Designers and Builders of Intricate, Automatic Precision Machines



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FIDELITY MACHINE COMPANY

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DRAW YOUR WIRE THE MODERN WAY with

GILRON COATING COMPOUNDS

A big step forward in wire drawing. Thoroughly proven in mill practice. Makes possible wire drawing speeds heretofore considered impracticable. Increases die life, prevents scratching of wire, produces better finish and eliminates use of lime in many cases.

These coating compounds are of particular value in the more difficult operations—stainless, alloy, high carbon and welding rod wire. Multiple reductions can be drawn without re-coating.

Coatings for Drawing Stainless, Alloy, Low and High Carbon and Copper Coated Wires

Let us confer with you. Write or telephone for particulars.

GILRON PRODUCTS COMPANY

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A War Bond is the seal of a faith well kept.

◆

Warner Company

BELLEFONTE DIVISION

MANUFACTURER

Bell-Mine Lime Products
For Use in Wire Drawing Processes

PLANT, BELLEFONTE, PA.

SALES OFFICES: PITTSBURGH, PHILADELPHIA, BELLEFONTE, N. Y. CITY

◆

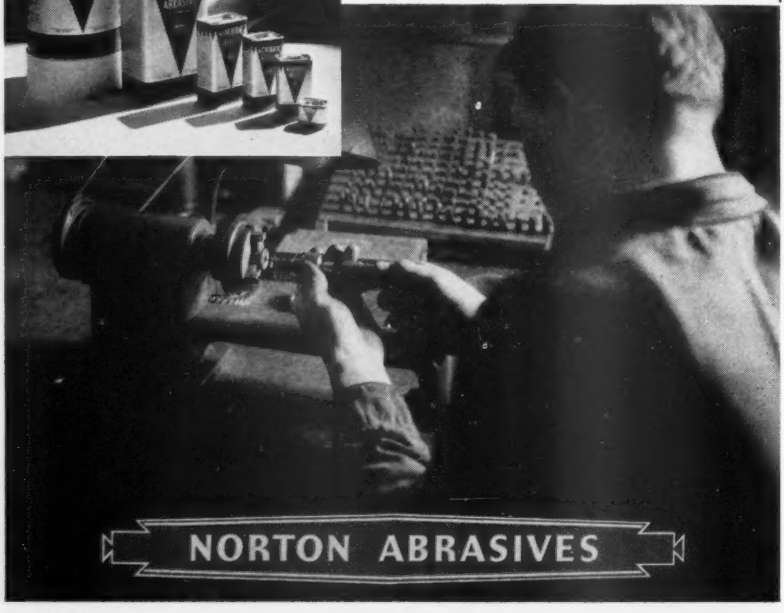
BACK THE ATTACK — WITH WAR BONDS

NORBIDE ABRASIVE FOR

Efficiently and Economically Shaping, Grinding and Polishing Cemented Carbide Wire Drawing Dies. Information on request.

N-58

NORTON COMPANY—Worcester 6, Mass.



NORTON ABRASIVES

Outstanding Personalities of the Wire Industry

(*Continued from Page 527*)

He has had more than twenty-five years' experience in the exportation of steel products and industrial equipment, traveling extensively abroad, especially in Europe and the Latin American countries. Prior to joining Wickwire Spencer, he served as Asst. Export Manager of the American Chain and Cable Co. for eight years.

✦ ✦ ✦

Albert S. Glossbrenner, Gen. Supt., Youngstown Sheet & Tube Company

ALBERT S. GLOSSBRENNER has been appointed general superintendent of the Youngstown district of Youngstown Sheet & Tube Co., succeeding **J. L. Mauthe**, who was appointed a vice-president of the company recently.

✦ ✦ ✦

MR. GLOSSBRENNER came to Youngstown eight years ago as assistant superintendent of the hot strip mill, becoming superintendent three years later. He was appointed to his recent position as superintendent of the Brier Hill plant in 1942. **Buford M. Stubblefield** has been appointed superintendent of the Brier Hill Works succeeding Mr. Glossbrenner. Mr. Stubblefield started to work for the company in 1916 at the Campbell Works Coke Plant; in 1920 he became assistant superintendent of the Coke Plant. A few years later he was made superintendent of the coke plant and blast furnaces at Campbell Works.

✦ ✦ ✦

Fred A. Daboll

FRED ALLYN DABOLL, Advertising Manager of Warner Company, died in the Lankenau Hospital on July 22rd after an illness of several months. He had just passed his 70th birthday.

✦ ✦ ✦

MR. DABOLL was graduated as a Civil Engineer at Lehigh University in 1896 and was employed on construction work until

he came with Charles Warner Company in 1899 as Sales Manager Philadelphia District. In 1908 he was made General Sales Manager.

✦ ✦ ✦

RESIGNING in 1926 to go into business for himself in Georgia, he returned in 1930 to become Advertising Manager of Warner Company.

✦ ✦ ✦

MR. DABOLL was active in Lehigh University Alumni affairs and had been President of the Cedar Hollow Building & Loan Association, Devault, Pa., for many years.

✦ ✦ ✦

Samuel J. Eberwein

SAMUEL J. EBERWEIN, age 47, Assistant Superintendent of The Electric Furnace Company, Salem, Ohio, for the past 20 years, died at his home in Salem on July 21.

✦ ✦ ✦

MR. EBERWEIN who was widely known throughout the industry was born June 12, 1896, at Slatington, Pennsylvania and was a graduate of Penn State University, College of Engineering.

✦ ✦ ✦

E. Perry Holder, President, Wickwire Spencer Steel Company

E. PERRY HOLDER, President of the Vulcan Iron Works, Wilkes-Barre, Pa., has been elected President of the Wickwire Spencer Steel Company, **Charles Allen, Jr.**, Chairman of the Executive Committee, announced recently. Mr. Holder succeeds **E. C. Bowers**, who has been connected with the company since 1911 and has been President since 1926. Mr. Bowers has resigned because of serious illness but will continue as a member of the Board of Directors and Executive Committee and act in an advisory capacity. **Carl I. Collins** will continue as Executive Vice President in charge of production.

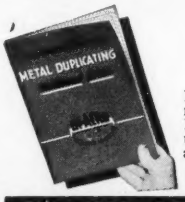
✦ ✦ ✦

A GRADUATE of Phillips Exeter Academy and of Yale College

(*Please turn to Page 536*)

METAL Stampings DUPLICATED WITHOUT DIES

If you desire to save time and critical materials on production of metal stampings or other small parts, then the DI-ACRO System of "Metal Duplicating Without Dies" merits your consideration. It is based on the rapid and accurate production of formed parts with DI-ACRO Shears, Brakes and Benders. All duplicated work is accurate to .001". These precision machines are adaptable to an endless variety of work, and ideally suited for use by girl operators. For short runs your parts are processed in a matter of hours instead of waiting weeks for dies.



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"METAL DUPLICATING WITHOUT DIES"

It illustrates many stampings or parts made without dies, gives full details on DI-ACRO machines and shows how they may readily be adapted for various applications. Request your copy now.

O'NEIL-IRWIN DI-ACRO PRECISION MACHINES MFG. CO. 303 Eighth Ave. So. Minneapolis 15, Minn.

"STANDARD" MACHINERY

FOR EVERY METAL PROCESSING NEED

● HYDRO-FORMER
Shapes and joins metals without cutting.

● SWAGING MACHINES
Eight sizes for hot and cold pointing.

● DRAW BENCHES AND WIRE DRAWING MACHINES
Reversing and continuous chain types for drawing up to 50,000 lbs.

● POWER PRESSES AND DROP HAMMERS
Low cost, precision blanking and embossing machines of all sizes.

● ROLLING MILLS
Special Two and Four-High Mills for breakdown and precision rolling.

● TURKS HEADS
Wire drawing to special shapes through friction and power driven rolls.

Detailed specifications furnished upon request.

STANDARD MACHINERY CO.
PROVIDENCE RHODE ISLAND

A BULLETIN THAT WILL HELP--

1 SPEED PRODUCTION
2 CUT COSTS
3 IMPROVE QUALITY

Wire drawing lubricants are highly specialized. And when you take the time and trouble to test various materials on your particular operations, you are certain to find one that will do a better, faster and more economical job.

YOURS FOR THE ASKING!

MAGNUS WIRE DRAWING COMPOUNDS

cover the entire range of wire drawing—wet, dry and grease drawing, on ferrous and non-ferrous wire. One of these may prove to be just what you need—as was the case with many producers of high carbon steel wire who have found in Magnus 52c-1 a perfect solution of their problem of getting high speed drawing in multi-pass operations. 52C-1 stays with the wire to the sixth draw, speeding up production by over 40%.

MAGNUS CHEMICAL COMPANY
188 South Avenue, Garwood, N. J.

Magnus CLEANERS

New! HEAVY DUTY MILLS
Size 20 & 22 x 60 Inch

for·· Compounding and Warming of Synthetic Rubber and Tough Resins. Custom built to your requirements.

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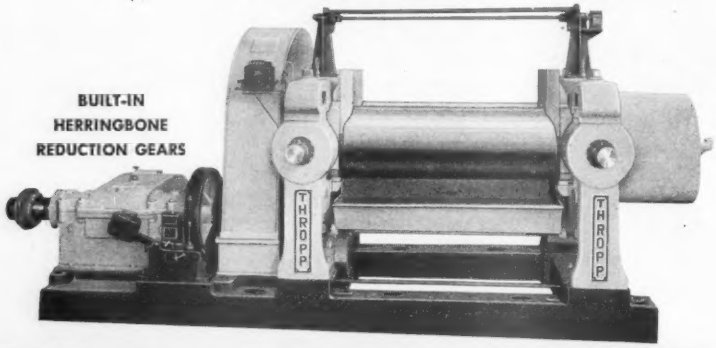


WM. R. THROPP & SONS CO. TRENTON *New Jersey*
WASHERS CRACKERS REFINERS CALENDERS

Outstanding Personalities of the Wire Industry

(*Continued from Page 535*)

with the Class of 1918. Mr. Holder served during the last war with the United States Army. While in college he was a laboratory assistant in Biology and taught in New Haven High School.

✦ ✦ ✦

PRACTICALLY all of his business career has been in executive positions connected with the manufacture and sale of steel and other metal products. During the N.R.A. he served on advisory boards of three industrial organizations — laundry machinery, gasoline pump and centrifugal manufacturers. He was Executive Vice-President of American Machine and Metals, Inc., New York City, until 1937 and since 1940 has been President of the Vulcan Iron Works of Wilkes-Barre in complete charge of all operations. He is resigning the latter position to become President of Wickwire Spencer.

✦ ✦ ✦

Bulletin on New Chip Breaker Grinder

A TECHNICAL bulletin (GT-158) giving complete specifications of a new higher capacity and more flexible chip breaker grinder has been made available by Carboloy Company, Inc., Detroit. Included in the bulletin are photographs and descriptions of how to use the new machine for grinding both angular and parallel type chip breakers, as well as grinding breakers in roller turner tools.

✦ ✦ ✦

ALSO shown are set-ups for using the grinder in grinding the top, relief angles, and radius in boring bits as well as for grinding flat form tools.

✦ ✦ ✦

INCLUDED in the bulletin are complete prices with and without pedestal as well as accessories available — including a vise capable of handling tools up to 2 in. wide.

Government Wire Production Information

(*Continued from Page 523*)

AT the beginning of the year, it was estimated that the United States would need between 25,000 and 30,000 of the critical small-sized diamond dies. At that time that seemed like a hopeless task, but today it appears quotas will be met and next year may see the end of the many problems and fears that faced this infant industry.

✦ ✦ ✦

General Electric Assigns Patents to Alien Property Custodian

THE Alien Property Custodian announced recently that the General Electric Co. has assigned to him 37 patents covering cemented or sintered hard carbides, used in the making of machine tools, and that these are now available for use by American industry on a non-exclusive, royalty-free basis. General Electric originally acquired these patents from Fried Krupp Aktiengesellschaft of Germany.

✦ ✦ ✦

IN addition, the Custodian controls 16 other patents on the same products and processes, which are used wherever great hardness and ability to wear well are desirable.

✦ ✦ ✦

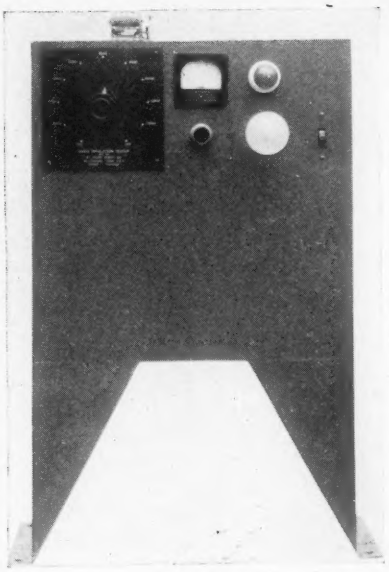
THE cemented carbides covered by these patents are formed of particles of a hard carbide such as tungsten carbide, with a metal such as cobalt to bind the particles. They are used for making deep drawing and extrusion dies, wire drawing dies and also for cutting tools in the machining and cutting of cast iron, nonferrous metals and alloys, bakelite, porcelain and hard steels. They are also used for tools, gauges and grinder parts that must resist wear and corrosion.

✦ ✦ ✦

ANY manufacturer wishing to use these important products should apply to the Office of Alien Property Custodian in Washington

(*Please turn to Page 538*)

SPARKER for SYNTHETIC EXTRUSION COMPOUNDS



THIS APPARATUS WILL LOCATE DIELECTRIC FAULTS while the wire is being insulated. When breakdown occurs, the operator is notified by an audible alarm. A resettable counter gives the number of faults in each reel. By sorting out the defective reels in this operation, the majority of the resparking is eliminated. Continuous range of voltage at the electrode is from one thousand to sixteen thousand kilovolts. The sparker is equipped with voltmeter reading in kilovolts, and automatic interlock with the takeup motor.

R. L. Davis Electric Co.
Wallingford, Conn.

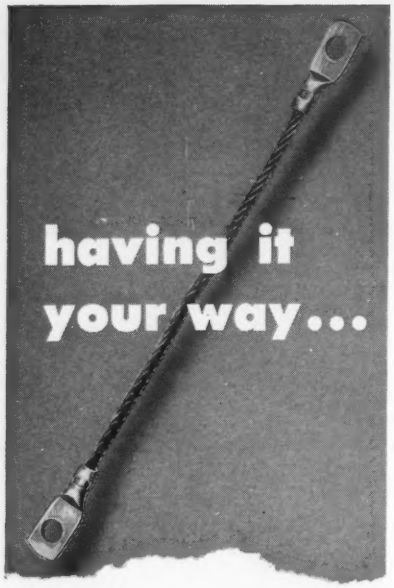
WILLEY'S DIES LAST MUCH LONGER

SIZING, EXTRUSION and WIRE DRAWING DIES

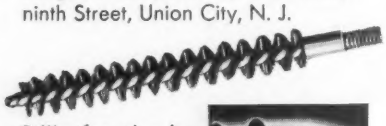
Manufactured in all sizes, to meet your requirements, from a specially developed grade of Tungsten Carbide having freedom from porosity, exceptional abrasion resistance and the ability to take a polish equal to that of diamonds. Furnished in four classifications, (1) blank and rough cored nibs, (2) rough cored dies, (cased), (3) semi-finished, rough drilled dies, (cased), (4) finished dies, ready to use.

WRITE FOR CATALOG

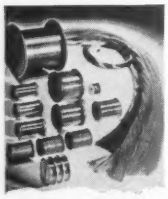
WILLEY'S CARBIDE TOOL CO.
1340 W. Vernor Highway, Detroit, Michigan



You tell us how you want your fine alloy wires and that's exactly the way you'll get them. Every step is precision engineered to produce wire of the required temper, tolerance and workability for its specific purpose. On repeat orders, too, you will find the same consistent quality, always uniform, easy to handle — dependable, right! If you want advice of a technical nature, such as heat-treating, or some difficult application, our metallurgists and engineers are glad to help. Meeting war emergencies has added valuable knowledge to our past quarter-century of accumulated experience. It's yours for the asking. Call on Callite Tungsten Corporation, 572 Thirty-ninth Street, Union City, N. J.



Callite fine wires in sizes as small as .002" (smaller if required) for springs, control cables, instruments, wire cloth, brushes, bonding jumpers, etc. are available in:



Beryllium-Copper, Aluminum, Phosphor-Bronze, Silicon-Bronze, Stainless Steel, Nickel-Silver, Monel Metal, Brass (all grades), Commercial Bronze, Hard-Drawn Low-Carbon Steel, Everdur, Silver, and Special Alloys. On Spools, coils, in 50" or 60" hanks, or cut to your specifications.

REG. U.S. CALLITE TUNGSTEN CORPORATION PAT. OFF.

CALLITE WIRES

A FINE WIRE FOR EVERY NEED

Government Wire Production Information

(*Continued from Page 537*)

in order to obtain a non-exclusive, royalty-free license valid for the life of the patents.

✦ ✦ ✦

Merchant Trade Steel Products

THE War Production Board today made a number of basic changes (effective October 1) in the plan for distributing merchant trade steel products through warehouses, under CMP. These changes were made to insure equitable distribution and permit every warehouse an equal opportunity to place orders for tonnages needed.

✦ ✦ ✦

GENERAL Preference Order M-21-b-2, as amended, permits warehouses to reorder for stock replacement all material sold in accordance with CMP Regulation No. 4, including deliveries to farmers.

✦ ✦ ✦

TO assure that each warehouse receives consideration on mill schedules, the order will be supplemented by warehouse load directives for most product groups. These directives will reserve a percentage of the base tonnage for each warehouse with the supplier who furnished material to the warehouse during the base period.

✦ ✦ ✦

WAREHOUSES may order replacements, on or after October 1, for all merchant trade products sold from stock since April 1, plus material sold to dealers and other warehouses under Order M-21-b-2, and not previously ordered for replacement on Form PD-83-G or CMP 11. Orders will be placed well in advance to permit cancellation of unwanted products, which will then be distributed to those warehouses which have not received their full requirements.

✦ ✦ ✦

UNDER the amended order there is no top limit to the amount of any merchant trade

ORDER YOUR COPY NOW—
LIMITED EDITION

Diamond and Gem Stone Industrial Production

PAUL GRODZINSKI

PRICE $5.00

The use of diamonds and gem stones as dies for fine wire drawing, and of diamonds for cutting tools, is comparatively recent. Today it is extensive and increasing. In this book the author has brought together all the data and information available on the subject and has added the results of his own experience and research. Although dealing mainly with the actual production of the dies and tools, the knowledge this book imparts is of prime importance to tool users. Efficiency and economy in the use of diamond and gem stone dies and tools is not possible without a knowledge of production methods.

✦ ✦ ✦

There are reference tables and a large number of specially drawn illustrations included in this book. An endeavor has been made to leave no phase of the subject untouched.

MAIL YOUR ORDER TODAY

WIRE & WIRE PRODUCTS

300 MAIN ST. STAMFORD, CONN.

FOR FINE WIRE NO FINER LUBRICANT

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Compounded especially for high-speed machines.

Completely soluble—No fillers—Hence no clogging up of spray jets.

Extremely stable: Uniform, die-saving, trouble-free lubricity at all times.

Economical in use—Efficient in operation.

Apex "SFV" Wire Drawing Compound

•

Address inquiries to:

APEX ALKALI PRODUCTS COMPANY

Main & Rector Sts., Phila. Pa.

If you MAKE or USE WIRE
YOU NEED ONE OF THE MANY

Porter Cutters

Indispensable in wire mills for sampling large wire.

In almost universal use by wire fabricators for cutting reinforcing fabric, fencing, spring wire, etc.

Useful in any plant—large or small—for all sorts of maintenance and repair work—for cutting bolts, rods, wires, rivets, wire rope, chains, or for splitting deformed or "frozen" nuts.

There is a standard Porter tool for every cutting job up to ¾" annealed bolts or ½" hardened chains. Special cutters designed to fit your industry's needs.

Send for Catalog of PORTER CUTTERS.

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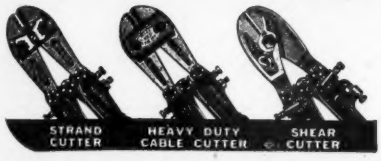
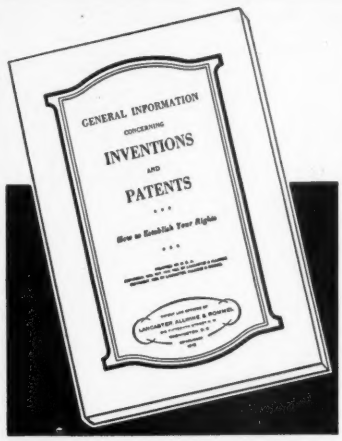
H. K. PORTER, INC.
EVERETT, MASS.





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Lancaster, Allwine & Rommel
Registered Patent & Trade-Mark Attorneys
438 Bowen Bldg., Washington, D. C.

product which a warehouse can handle during a given period, other than the limitation that every order placed after October 1 must be backed by a record of previous deliveries from stock equal to the tonnage being ordered.

✦ ✦ ✦

NO distinction is made between the different types of steel. Products of carbon or alloy steel are interchangeable as far as stock replacement is concerned.

✦ ✦ ✦

THE effective date of the order has been delayed until October 1, to permit the some 20,000 distributors of merchant products to acquaint themselves with the procedures under this order and to allow sufficient time for the issuance of warehouse load directives to each steel producer.

✦ ✦ ✦

ON the effective date of this order welded wire concrete reinforcing fabric will become a product group under Order M-21-b-2, instead of Order M-21-b-1, and the WPB recently issued Order M-21-b-1 as amended to effect this change.

✦ ✦ ✦

Radio Wire

ATTENTION of radio jobbers was called recently to the fact that they may apply for relief to the War Production Board on Form PD-470 (WPB-1161) listing frozen stocks of copper wire mill products by amounts, sizes and types which cannot be sold in accordance with CMP Regulation 4. It should be pointed out that in the event an application should be approved by WPB, copper wire sold under such authorization cannot be replaced in stock.

This is an invitation for you to become a member of The Wire Association.

The Annual Dues are $10.00

APEX "PIC-KLEEN"

SIMPLIFIES CLEANING HOUSE PROCEDURE

A Proven Product that:

1. **Cuts lime consumption**
2. **Eliminates sull-coating**
3. **Inhibits rust in storage**
4. **Conserves dies & lubricants**
5. **Reduces handling costs**

For High and Low Carbon Rods and Wire

Now in use in many mills
Ask us for complete information

COSTS LITTLE — SAVES MUCH

APEX ALKALI PRODUCTS COMPANY

Main and Rector Streets
PHILADELPHIA, PA.

HOW TO REDUCE ACID BRITTLENESS EASILY

For various classes of low carbon wire rods, many mills find that by soaking rods for short period in a boiling solution of Oakite Composition No. 24, acid brittleness is eliminated.

In the case of high carbon stock, a substantial reduction in baking time is secured by immersing rods in the same solution for ten minutes.

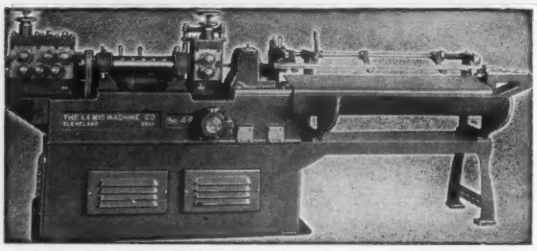
To see how you can successfully, easily adapt Oakite methods to reduce acid brittleness, shorten baking time and increase output, write TODAY for further data. Our nearby Technical Service Representative stands ready to make tests.

OAKITE PRODUCTS, INC.
52A THAMES ST., NEW YORK 6, N. Y.

Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE MATERIALS METHODS SERVICE — Buy Bonds for Victory

LEWIS TRAVEL-CUT WIRE STRAIGHTENING and CUTTING Machines

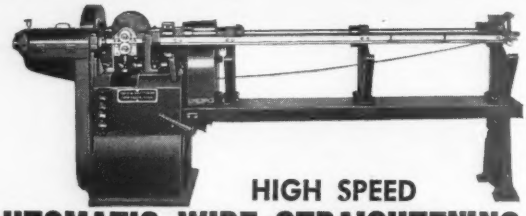


Machines for 1/16" to ¾" rod
Round
Square
Flat
Hexagon
Ferrous and Non-Ferrous

Automatic
High Speed
Heavy Duty

The Sign of Dependable Service:
WE CAN SUPPLY AND ENGINEER OUR TOOLS EQUIPPED WITH CARBOLOY CEMENTED CARBIDE

THE LEWIS MACHINE CO., 3445 E. 76 St., Cleveland, Ohio



HIGH SPEED
AUTOMATIC WIRE STRAIGHTENING & CUTTING MACHINES
made in many sizes and lengths
THE F. B. SHUSTER CO. NEW HAVEN, CONN.

NILSON
AUTOMATIC PRESS AND FOUR SLIDE MACHINE
FOR SWAGING, STAMPING, PIERCING, BLANKING, FORMING OF COILED METAL
WE also build machines for forming Paper Clips, Buckles, Gate Hooks, Coat and Hat Hooks, Ceiling Hooks, Wire Ears, Cable Rings, Screw Eyes, Sash Chains, Automobile Side Chains, Flat Open Link Chains, Staples, Cotter Pins, Hose Clamps, Etc., and Wire Straighteners, Wire Reels, Frame Bending Machines and Special Presses.
For Complete Details Address —
THE A. H. NILSON MACHINE CO.
BRIDGEPORT, CONN., U. S. A.

WIRE MEASURING MACHINE
FOR LINEAR MEASURE
PROVIDES NEW STANDARD OF ACCURACY
Illustration Shows Exclusive Patented "3V" Principle
Measuring twisted, armored, bare or insulated wire without vibration or inaccuracies at any speed or varying speeds!
Write for Information and Prices
LYON-VAIL MACHINE CO., INC.
97 Belmont Street, BROCKTON, Massachusetts
LYONBILT

The Importance of Wire in War

(*Continued from Page 510*)

Ball and roller bearings
Rivets for Army cots
Coat hangers and hooks for cantonments
Bale ties for salvaged scrap
"Metallizing" wire for maintenance
Light guards for tanks
Motorcycle wheel spokes
Signal flare spikes
Shoe nails

✦ ✦ ✦

CHAIN and chain assemblies made of rods or wire are important in national defense. A recent WPB Limitation Order (L-302) lists some types: anchor (stud link), band track, bead, buoy, jewelry (for identification tags), metal pickling, pocket and sprocket wheel, hoist, conveyor, ladder, tire, universal, brass and sash chains. The term "chain assembly" refers to chain that has been cut to length and assembled with accessories for a specific purpose.

✦ ✦ ✦

THE Medical Corps of the services use wire in many forms —wire cloth for emergency splints, wire for parts of operating tables, surgical instruments, hypodermic needles, and in many other forms already referred to in other connections.

✦ ✦ ✦

IN its study of wire for the "M" day, the Signal Corps estimated some ten years ago that the direct requirements for wire and wire products, that is, the items procured by the supply services directly, represented only 17% of the total war requirements, and that most of their needs, in terms of kind, not quantity, fell naturally into everyday requirements. This estimate has proven to be remarkably accurate in the present conflict, as information received from time to time from manufacturers indicate that from 80% to 90% of the wire being made for war uses is going through regular trade channels, and that only approximately 15% is being purchased directly for the account of this branch.

WIRE carries electricity that takes the power to machines that turn out our tanks, our shells, our guns, our ammunition. Wire goes into our fighting and cargo ships and their equipment. Wire keeps the various branches of the armed services in communication with one another—whether directly or by radio. Wire helps our bombers to inform the Axis that the might of free peoples is growing and will ultimately destroy them. Wire is used in everything that it takes to win the war.

✦ ✦ ✦

Splicing and Rewinding Band Iron Cuts Machine Stoppage

FULL time use of winding machinery geared to pre-war specifications of raw material supplies suffered when material shortages resulted in suppliers sending smaller than standard rolls of band iron to General Electric's Schenectady Works.

✦ ✦ ✦

THE average roll received contains only 60 pounds of raw material, compared to the pre-war standard of 275 pounds. In running these rolls through the armoring machine in the cable department it was necessary to stop and splice at the end of each roll. Machine stoppage time jumped from a normal 30 minutes per 1000 units to 137 minutes, an increase of 357 per cent in machine stoppage.

✦ ✦ ✦

TO correct this condition and to obtain standard utilization of the armoring machine, less-than-standard rolls are now spliced and rewound into standard 275-pound units before they are inserted into the armoring machine. Figured on a full year's operation at 135 work-hours per week, 798 man-hours are gained by rewinding the 60 pound rolls into "standard" 275 pound units.

AD THOUGHT

ADVERTISING is a service to a magazine's readers. Methods, materials, machinery, are developing under the stress of war. Both editorial matter and advertisements keep you informed on what is happening in industry. Answer ads when they interest you, and PLEASE mention WIRE & WIRE PRODUCTS.

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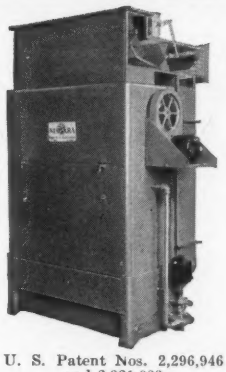
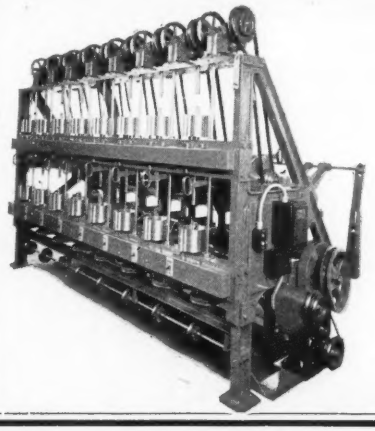


U. S. Patent Nos. 2,296,946 and 2,321,933



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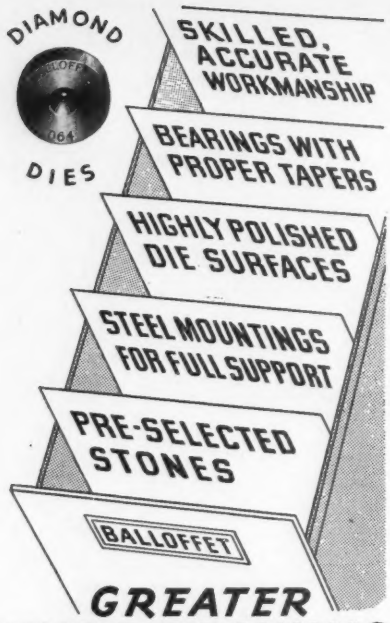

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News of the Industry

THE National Wire Machinery Company of Lynn, Mass., report that in addition to their wire machinery business, they are at present engaged in subcontracting machine jobs for war industries.

✦ ✦ ✦

THEY are machining universal joints, bearings, diesel pistons and submarine parts and contributing materially to the war effort.

✦ ✦ ✦

MR. ANDERSON, formerly with the Thomson Judd Wire Machinery Company has been appointed sales manager.

✦ ✦ ✦

JAMES L. ENTWISTLE of Providence, Rhode Island, reports the development of a new hydraulic lift on his sparker that lifts the coils into place by power. A number of these have been ordered by the Russian government and while there are none in use yet in the United States it is expected there shortly will be some.

✦ ✦ ✦

THIS company also has a completed airplane engine harness tester which has proven very successful.

✦ ✦ ✦

REPORTS on the steel wire industry in Worcester, Mass., would indicate that some Lend-Lease wire orders in that area have been cancelled. While this naturally reduces the backlog of the mills they are still over-busy on Signal Corps wire and it is expected that production will hold up materially in this connection.

✦ ✦ ✦

AN interesting item: the Superior Tool & Mfg. Company of Worcester, Mass., has recently brought back into production a machine that was first used by

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+ + +

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+ + +

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THE South African Iron and Steel Corporation is reported by the press to be manufacturing a baling wire that is equal to the product that was formerly imported.

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Army News Briefs

"BOMBING" a glacier with telephone wire was just one of the schemes the Signal Corps had to use to establish communications on our Alaskan frontier, according to **Colonel Harry L. Vitzthum,** who has just returned from a thirty-month tour of duty as Signal Officer of the Alaska Defense Command.

✦ ✦ ✦

THE bombing took place while the Alaska Railroad was being extended. A tunnel had to be dug under a moving glacier, and communications were badly needed even before its completion. Survey of the route across the glacier showed the difficulties of transporting the heavy reels of telephone wire across its rugged and nearly impassable expanse.

✦ ✦ ✦

AT the suggestion of an ingenious Signal Corps lieutenant, ten reels of twisted-pair telephone wire were loaded aboard an Army bomber. With bomb bay doors open, the plane flew over the glacier, aiming a reel at each of the stakes that had been lined up in the deep snow. Only one of the ten reels was lost. The line crew then struggled out onto the glacier and strung the wire from reel to reel. Even without the task of carrying the heavy, awkward reels across the rugged glacier, the job of establishing communications was neither easy nor safe. Shortly after the line was completed, a workman froze to death trying to cross this glacier.

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AIR DRAW FURNACES—
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ALKALINE CLEANERS—
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Apex Alkali Products Co., Philadelphia, Pa.

ANNEALING MACHINES—Open Flame
Syncro Machine Co., Rahway, N. J.

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Scudder, E. J., Foundry & Machine Co., Trenton, N. J.

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New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

BAKERS—Hi-Speed
Carl-Mayer Corp., The, Cleveland, Ohio.

BAKERS—Rod and Wire
Carl-Mayer Corp., The, Cleveland, Ohio.
Morgan Construction Co., Worcester, Mass.
Moslo Machinery Co., Cleveland, Ohio.
Ross, J. O., Engineering Corp., New York, N. Y.

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BOBBINS—Braider and Wire Weaving
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BRICKS—Acid Proof
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CABLE LACQUERING OVENS
Industrial Oven Engr. Co., Cleveland, Ohio.

CARRIERS—Braider, High Speed
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Carter, B. & F., & Co., Ltd., Bolton, England.
Mossberg Pressed Steel Corp., Attleboro, Mass.

CEMENTS—Refractory
Norton Co., Worcester, Mass.

CHEMICALS—Cleaning
American Chemical Paint Co., Ambler, Pa.
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Magnus Chemical Co., Garwood, N. J.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

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Wilson, Lee, Engr. Co., Cleveland, Ohio

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Gilron Products Co., Cleveland, Ohio

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COMPOUNDS—Metal Finishing
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COMPOUNDS—Rust Preventing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

COMPOUNDS—Rust Removing
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

COMPOUNDS—Wire Drawing
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Standard Industrial Compounds Co., Chicago, Ill.

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Hubbard Spool Co., Chicago, Ill.
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Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

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Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel Co., McKeesport, Pa.
Vascoloy-Ramet Corp., North Chicago, Ill.

CUTTING TOOLS—Wire
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Vianney Wire Die Works, New York, N. Y.
Wayne Wire Die Co., Hillside, N. J.

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Vascoloy-Ramet Corp., North Chicago, Ill.
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Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Works, New York, N. Y.
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Vaughn Machinery Co., Cuyahoga Falls, O.

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DRUMS—Vulcanizing
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Lewis, Kenneth B., Worcester, Mass.

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Electric Furnace Co., Salem, O.
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Automatic
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, O.
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio

FURNACES—Brazing
Electric Furnace Co., Salem, O.
Firth-Sterling Steel Co., McKeesport, Pa.

FURNACES—Bright Annealing
Electric Furnace Co., Salem, O.
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Electric
Electric Furnace Co., Salem, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio

FURNACES—Hardening & Tempering
Carl-Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio

FURNACES—Lead Melting
Electric Furnace Co., Salem, Ohio
Robertson, John, Co., Brooklyn, N. Y.

FURNACES—Non-Oxidizing
Carl-Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio

FURNACES—Normalizing
Carl-Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Rockwell, W. S., Co., New York, N. Y.

FURNACES—Salt Bath
Electric Furnace Co., Salem, Ohio
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.

FURNACES—Wire, Strip & Sheet
Carl-Mayer Corp., The, Cleveland, Ohio
Electric Furnace Co., Salem, Ohio
Rockwell, W. S., Co., New York, N. Y.
Surface Combustion, Div. of General Properties Co., Inc., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

GALVANIZING EQUIPMENT—
Wilson, Lee, Engr. Co., Cleveland, Ohio.

GALVANIZING KETTLES—
National Annealing Box Co., Washington, Penna.

GRINDERS—Roll
Norton Co., Worcester, Mass.

HI-SPEED BAKERS—
Carl-Mayer Corp., The, Cleveland, Ohio

HOISTS—Electric Travelling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

INHIBITORS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin, Wm. M., Co., The, Pittsburgh, Pa.

KETTLES—Galvanizing, Annealing, Tinning, etc.
National Annealing Box Co., Washington, Penna.

LATHES—Die Reaming
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

LIME—
Warner Co., Bellefonte, Pa.

LUBRICANTS—For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Standard Industrial Compounds Co., Chicago, Ill.

LUBRICANTS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Bick, Hans C., Inc., Reading, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y. Co., Phila., Pa.
National Wire Machinery Co., Lynn, Mass.
New England Butt Co., Providence, R. I.
Robertson, John, Co., Brooklyn, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Braiding
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Robinson Mfg. Co., Muncy, Pa.
Watson Machine Co., Paterson, N. J.

MACHINERY—Brazing
National Wire Machinery Co., Lynn, Mass.

MACHINERY—Bunching
American Insulating Mach'y. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bundling, Scrap
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cable, Electric
American Insulating Mach'y. Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
National Wire Machinery Co., Lynn, Mass.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Chain Making
Nilson, A. H., Machine Co., The, Bridgeport, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Closing
New England Butt Co., Providence, R. I.
Robinson Mfg. Co., Muncy, Pa.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coil Winding
Robinson Mfg. Co., Muncy, Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Coilers
Broden Construction Co., Cleveland, Ohio
Morgan Construction Co., Worcester, Mass.
New England Butt Co., Providence, R. I.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.

WHERE TO BUY, Continued

Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Copper Wire Drawing and Rolling
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire
Fidelity Machine Co., Philadelphia, Pa.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Cutting
Broden Construction Co., Cleveland, Ohio
Lewis Machine Co., The, Cleveland, Ohio
Moslo Machinery, Inc., Cleveland, Ohio
National Machinery Exchange (Used), New York, N. Y.
Nilson, A. H., Machine Co., The, Bridgeport, Conn.
Shuster, F. B., Co., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Die Making
Firth-Sterling Steel Co., McKeesport, Pa.

MACHINERY — Die Making for Forming Special Shapes
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

MACHINERY—Draw Benches
Standard Machinery Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Edging
Standard Machinery Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Enameling
American Insulating Mach'y. Co., Phila., Pa.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Extruding
Robertson, John, Co., Brooklyn, N. Y.
Royle, John, & Sons, Paterson, N. J.
Thropp, Wm. R., & Sons Co., Trenton, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Flat Wire
Broden Construction Co., Cleveland, Ohio
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Forming
National Machinery Exchange (Used), New York, N. Y.
Nilson, A. H., Machine Co., The, Bridgeport, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Galvanizing
Broden Construction Co., Cleveland, O.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wilson, Lee, Engr. Co., Cleveland, Ohio

MACHINERY—Galvanizing Wire
Wilson, Lee, Engr. Co., Cleveland, Ohio.

MACHINERY—Gang Winders
Fidelity Machine Co., Philadelphia, Pa.
Robinson Mfg. Co., Muncy, Pa.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., Worcester, Mass.

MACHINERY—Hydraulic Testing
Riehle Testing Machine Div. of American Machine & Metals, Inc., East Moline, Ill.

MACHINERY—Insulating
American Insulating Mach'y Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Knitting
Fidelity Machine Co., Philadelphia, Pa.

MACHINERY—Lead Encasing Presses, etc.
Robertson, John, Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
Robertson, John, Co., Brooklyn, N. Y.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Magnet Wire
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Material Handling
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.

MACHINERY — Measuring Wire & Cable
Davis, R. L., Electric Co., Wallingford, Conn.
Durant Mfg. Co., Milwaukee, Wis.
Lyon-Vail Machine Co., Brockton, Mass.
New England Butt Co., Providence, R. I.
Robinson Mfg. Co., Muncy, Pa.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Glader, Wm., Machine Works, Chicago, Ill.
National Machinery Exchange (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Panning
American Insulating Mach'y Co., Phila., Pa.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Pointing
Broden Construction Co., Cleveland, Ohio
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Quill Winding
Fidelity Machine Co., Philadelphia, Pa.

MACHINERY—Rod Mill
Broden Construction Co., Cleveland, Ohio
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.

MACHINERY—Rolling Mill
Broden Construction Co., Cleveland, Ohio
Morgan Construction Co., Worcester, Mass.
National Machinery Exchange (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Standard Machinery Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Rubber for Insulating Wire
Royle, John, & Sons, Paterson, N. J.

MACHINERY—Rubber Strip Covering
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Rubber Tubing and Straining
New England Butt Co., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Rubber Working, Mills, Calendars, etc.
Thropp, Wm. R., & Sons Co., Trenton, N. J.

MACHINERY—Screw Wire
National Machinery Exchange (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Special
American Insulating Mach'y Co., Phila., Pa.
Broden Construction Co., Cleveland, Ohio
Emory, Robert J., Co., Newark, N. J.
New England Butt Co., Providence, R. I.
Robinson Mfg. Co., Muncy, Pa.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I. (Special Designs)
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spooling
American Insulating Mach'y Co., Phila., Pa.
Emory, Robert J., Co., Newark, N. J.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Robinson Mfg. Co., Muncy, Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spring Making
National Machinery Exchange (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Broden Construction Co., Cleveland, Ohio
Lewis Machine Co., The, Cleveland, Ohio
Moslo Machinery Co., Cleveland, Ohio
National Machinery Exchange (Used), New York, N. Y.
Nilson, A. H., Machine Co., The, Bridgeport, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Shuster, F. B., Co., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Stranding
National Wire Machinery Co., Lynn, Mass.
New England Butt Co., Providence, R. I.
Robinson Mfg. Co., Muncy, Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Strip Steel
Broden Construction Co., Cleveland, Ohio
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Swaging
National Machinery Exchange (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
National Wire Machinery Co., Lynn, Mass.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Testing
Riehle Testing Machine Div., of American Machines & Metals, Inc., East Moline, Ill.
Robinson Mfg. Co., Muncy, Pa.
Scott, Henry L., Co., Providence, R. I.

MACHINERY—Testing Size of Wire
Davis, R. L., Electric Co., Wallingford, Conn.

MACHINERY—Testing Spring
Standard Machinery Co., Providence, R. I.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Trolley Wire
Vaughn Machinery Co., Cuyahoga Falls, O.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Tube Mill
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Welding Wire
Micro Products Co., Chicago, Ill.
National Wire Machinery Co., Lynn, Mass.
Shuster, F. B., Co., New Haven, Conn.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Bending
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

MACHINERY—Wire Drawing
American Insulating Mach'y Co., Phila., Pa.
Broden Construction Co., Cleveland, Ohio
Morgan Construction Co., Worcester, Mass.
National Machinery Exchange (Used), New York, N. Y.
National Wire Machinery Co., Lynn, Mass.
Robinson Mfg. Co., Muncy, Pa.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Wire Measuring
Durant Mfg. Co., Milwaukee, Wis.
Lyon-Vail Machine Co., Inc., Brockton, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Rope
National Wire Machinery Co., Lynn, Mass.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Tinning
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Wood Screw
National Machinery Exchange (Used), New York, N. Y.

WHERE TO BUY, Continued

MATERIAL HANDLING EQUIPMENT
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

MILLS—Tandem Rolling and Edging
Standard Machinery Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.

NICKEL SILVER AND PHOSPHOR BRONZE—Rod, Wire and Strip
Hudson Wire Co., Ossining, N. Y.

OILS—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Standard Industrial Compounds Co., Chicago, Ill.

OVENS—Cable Lacquering
Industrial Oven Engr. Co., Cleveland, Ohio

OVENS—Industrial
Carl-Mayer Corp., The, Cleveland, Ohio
Industrial Oven Engr. Co., Cleveland, Ohio
Ross, J. O., Engineering Corp., New York, N. Y.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.

PAINTS—Marine
American Chemical Paint Co., Ambler, Pa.

PAINTS—Structural Steel
American Chemical Paint Co., Ambler, Pa.

PANS—Lead and Spelter
National Annealing Box Co., Washington, Penna.

PANS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.

PAPER—Creped Wrapping
Crepe-Kraft Co., Newark, N. J.

PAPER TESTERS—
Scott, Henry L., Co., Providence, R. I.

PATENT ATTORNEYS—
Lancaster, Allwine and Rommel, Washington, D. C.

PICKLING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Parkin, Wm. M., Co., Pittsburgh, Pa.

PIPES AND FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

PLASTIC TESTERS—
Scott, Henry L., Co., Providence, R. I.

POTS—Lead Melting
Robertson, John, Co., Brooklyn, N. Y.

POWDER—Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.

PRESSES—Hydraulic and Mechanical
Robertson, John, Co., Brooklyn, N. Y.
Standard Machinery Co., Providence, R. I. (Mechanical Only)

PRESSES—Lead
Robertson, John, Co., Brooklyn, N. Y.

PRESSURE VESSELS—
National Annealing Box Co., Washington, Penna.

PULLERS—Wire
Scudder, E. J., Fdry. & Mach. Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

PUMPS—Hydraulic
Robertson, John, Co., Brooklyn, N. Y.

QUENCHING BATH CONTROLS—
Niagara Blower Co., Buffalo, N. Y.

REEL AND TENSION STAND—
Fidelity Machine Co., Philadelphia, Pa.
Moslo Machinery Co., Cleveland, Ohio
Robinson Mfg. Co., Muncy, Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS—Annealing and Stranding
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Moslo Machinery Co., Cleveland, Ohio
Mossberg Pressed Steel Corp., Attleboro, Mass.
Shuster, F. B., Co., New Haven, Conn.
Stevens Metal Products Co., Niles, O.

REELS—Steel
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REELS AND SPOOLS—Shipping and Shop
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REELS—Takeoff
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Moslo Machinery Co., Cleveland, Ohio
Mossberg Pressed Steel Corp., Attleboro, Mass.
Shuster, F. B., Co., New Haven, Conn.
Stevens Metal Products Co., Niles, O.

REELS—Vulcanizing and Impregnating
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Shuster, F. B., Co., New Haven, Conn.
Stevens Metal Products Co., Niles, O.

REELS—Wire Drawing
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Moslo Machinery Co., Cleveland, Ohio
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REFRACTORIES—High Temperature
Norton Co., Worcester, Mass.

ROD BAKERS—
Carl-Mayer Corp., The, Cleveland, Ohio
Moslo Machinery Co., Cleveland, Ohio
Ross, J. O., Engineering Corp., New York, N. Y.

RODS—Wire—Non-Ferrous
Hudson Wire Co., Ossining, N. Y.
Platt Bros. & Co., The, Waterbury, Conn.

RODS—Wire—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.

ROLL STRAIGHTENERS—
Moslo Machinery Co., Cleveland, Ohio

RUBBER AND RUBBER COMPRESSION TESTERS—
Scott, Henry L., Co., Providence, R. I.

RUST PROOF COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

RUST REMOVING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.

SHEARS—
O'Neil-Irwin Mfg. Co., Minneapolis, Minn.

SHEET—Steel
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.

SOAPS—Industrial and Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Standard Industrial Compounds Co., Chicago, Ill.

SPOOLS—Annealing and Wire Drawing
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

SPOOLS—Shipping and Shop
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

SPOOLS—Steel
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

STAMPINGS—Steel
Hubbard Spool Co., Chicago, Ill
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIP—Brass and Non-Ferrous
Hudson Wire Co., Ossining, N. Y.

STRIP—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Firth-Sterling Steel Co., McKeesport, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.

STRIP METAL TESTERS—
Scott, Henry L., Co., Providence, R. I.

SWIFTS—Take-off
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.

TANK LININGS—Brick
Keagler Brick Co., Steubenville, Ohio.

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TANKS—Pickling
Haveg Corp., Newark, Del.

TANKS—Steel
Mossberg Pressed Steel Corp., Attleboro, Mass.

TEMPERATURE CONTROLS—
Niagara Blower Co., Buffalo, N. Y.

TENSILE TESTERS—
Scott, Henry L., Co., Providence, R. I.

TESTING INSTRUMENTS—
Riehle Testing Machine Div. of American Machine & Metals, Inc., East Moline, Ill.
Scott, Henry L., Co., Providence, R. I.

TOOLS—Wire Cutting
Porter, H. K., Inc., Everett, Mass.

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TREADS—Safety
Norton Co., Worcester, Mass.

TRUCKS—
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

TUBE BENDERS AND FORMERS—
Ruesch, H. J., Machine Co., Newark, N. J.

TURKS HEADS—Friction and Power Driven
Standard Machinery Co., Providence, R. I.

VALVES AND FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

VULCANIZERS—
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

WELDERS—Spot and Butt
Micro Products Co., Chicago, Ill.
Moslo Machinery Co., Cleveland, Ohio

WIRE—Cold Heading
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.

WIRE—Electric
Hudson Wire Co., Ossining, N. Y.

WIRE—Enameled for Coils
Winsted Div. of Hudson Wire Co., Winsted, Conn.

WIRE—Manufacturers
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Firth-Sterling Steel Co., McKeesport, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.

WIRE—Music
Jersey Steel & Wire Corp., Irvington, N. J.

WIRE—Nickel Silver and Phosphor Bronze
Callite Tungsten Corp., Union City, N. J.
Hudson Wire Co., Ossining, N. Y.

WIRE—Non-Ferrous to Specification for Special Purposes
Callite Tungsten Corp., Union City, N. J.
Hudson Wire Co., Ossining, N. Y.
Winsted Div. of Hudson Wire Co., Winsted, Conn.

WIRE—Spring
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Firth-Sterling Steel Co., McKeesport, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.

WIRE—Stainless Steel
Callite Tungsten Corp., Union City, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.

WIRE—Steel—Also Coppered Steel—Also Galvanized Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.

WIRE AND STRIP—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

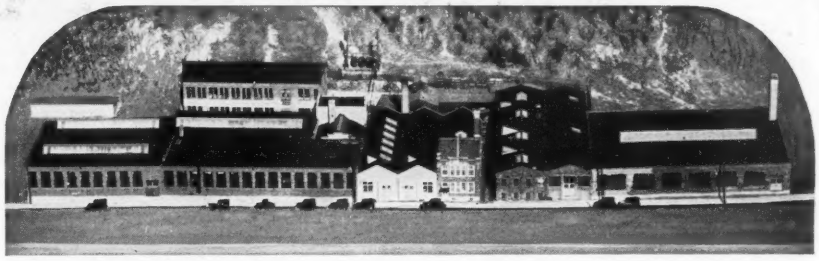
WIRE TESTERS—
Scott, Henry L., Co., Providence, R. I.

WIRE, WEAVING—Non-Ferrous
Hudson Wire Co., Ossining, N. Y.

WRAPPING PAPER—Creped
Crepe-Kraft Co., Newark, N. J.

YARN TESTERS—
Scott, Henry L., Co., Providence, R. I.

HUDCO



HUDSON WIRE CO. PLANT AT OSSINING, N. Y.

This plant is one of the most up-to-date and completely equipped plants in the world for the production of "HUDCO" fine wires in all metals.

ESTABLISHED IN 1902

HUDCO

WIRES FOR METAL SPRAYING

Pure Lead, Lead Alloy, Pure Zinc, Zinc Alloy, Copper, Tin, High Brass, Low Brass, Solder Wire, High Conductivity, Electric Wire. Cadmium, Nickel Silver, Aluminum, Monel Metal, Phosphor Bronze, Pure Nickel, Commercial Bronze, Brush Wires, Crimp and Straight, Brass, Steel, Nickel Silver, Copper and Phosphor Bronze.

HUDCO

FINE BARE WIRES

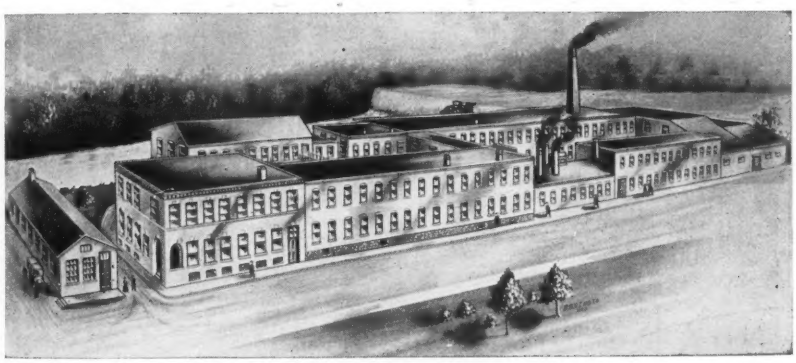
High Brass, Low Brass, Zinc 99.99+ and High Tensile Zinc, Commercial Bronze, Phosphor Bronze, Pure Tin, Lead, Antimonial Lead, Tinsel Lahns, Silver Plated Copper, False Gold and Copper. Cadmium, Nickel Silver, Silver Plated Copper, False Gold and Special Brass and Bronze Alloys to Specification, Metallic Fibre for Packing Purposes, Copper, Bronze, Zinc, Lead and Aluminum.

"HUDCO" specially processed Copper Wire for enamelling purposes is drawn from Selected Copper, insuring the maximum conductivity. This is but one example of the use of the most advanced and approved materials and methods in our processing.

BETTER WIRE AT LOWER COST

Send Us Your Specifications and Let Us Quote Prices

HUDSON WIRE COMPANY • OSSINING, N. Y.



Winsted Division of HUDSON WIRE CO. at Winsted, Conn., modern and completely equipped enamelled wire plant for LEAKPROOF ENAMELLED WIRE and all standard and special coverings.

WINCO

"WINCO" enamelled wire is drawn from special selected copper, assuring perfect enamelling. All wire tested before shipment.

"WINCO" enamelled wire is available in all standard and special coverings made to meet exacting requirements.

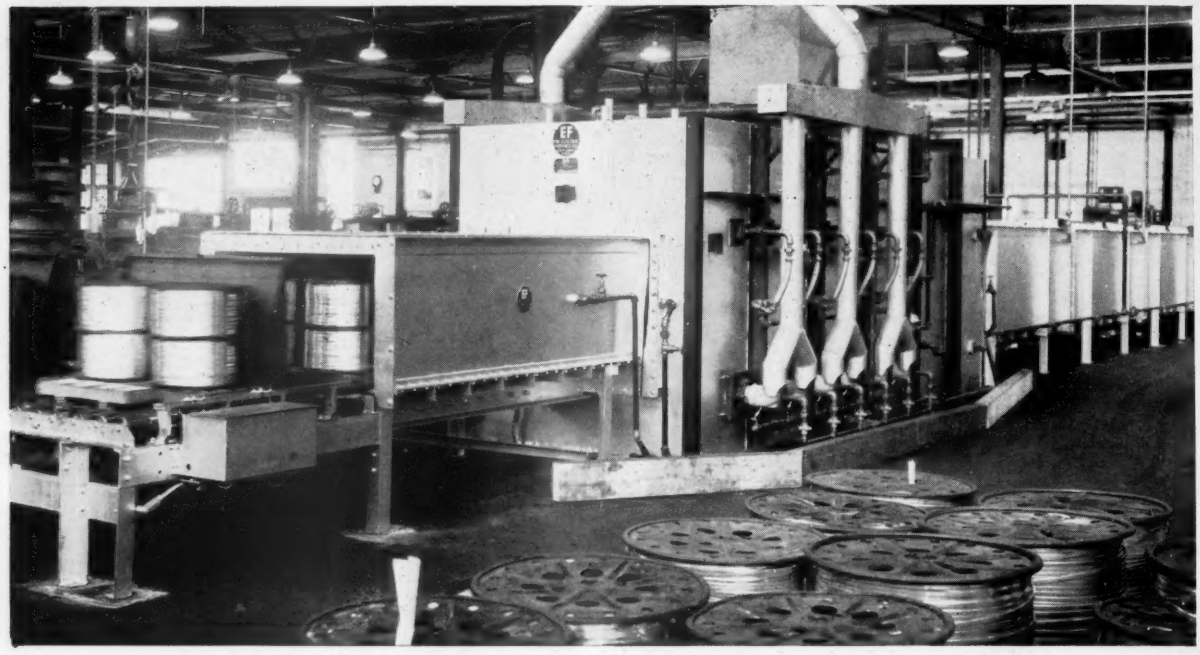
Samples of LEAKPROOF and other enamelled wires sent on request

WINSTED DIVISION OF HUDSON WIRE COMPANY

WINSTED, CONN.

EF FURNACES

For Every Industrial Heat Treating Process



This Combination Gas-Electric Furnace

With Heavy V-type Cast Grid Heating Elements
and EF Gas-Fired Recuperative Type Radiant Tubes

Bright Anneals 1¼ Tons Copper Wire Per Hour

Bright, uniformly annealed copper wire—at the rate of 1¼ tons per hour—is produced continuously in the above combination gas-electric, controlled atmosphere furnace. This furnace handles rod in coils up to 36" in diameter as well as wire on large reels. The material is carried through the furnace on bulkhead type trays which provide an effective seal for the protective atmosphere used in the equipment. These trays eliminate the necessity of doors, lock chambers, or other sealing devices at either the charging or discharging ends of the furnace.

The heating chambers are divided into two separately and automatically controlled zones. The first or charging zone is heated by EF gas-fired recuperative type radiant tubes. The second or soaking zone is heated by heavy V-type cast alloy heating elements.

The heating elements in each zone are located above and below the charge and extend the entire width of the chambers, insuring absolute temperature uniformity throughout the charge.

The protective atmosphere is produced in an EF generator furnished with the furnace.

Other recent outstanding production furnace installations include furnaces for bright annealing both ferrous and non-ferrous strip, wire, tubing and other products . . . furnaces for the production heat treatment of tank armor castings, cartridge cases, shell forgings, bomb and gun parts, machine gun cartridge clips, aircraft and aircraft engine parts, aluminum and magnesium castings, bolts, springs, and many other allied products.

We specialize in designing and building production furnaces.

The Electric Furnace Co., Salem, Ohio

Gas Fired, Oil Fired and Electric Furnaces---For Any Process, Product or Production

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